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**LTE;
Evolved Universal Terrestrial Radio Access (E-UTRA);
User Equipment (UE) conformance specification;
Radio transmission and reception;
Part 3: Radio Resource Management (RRM) conformance testing
(3GPP TS 36.521-3 version 14.1.0 Release 14)**

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Contents

Foreword

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Introduction

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

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

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

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

1 Scope

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

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

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

2 References

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3 Definitions, symbols and abbreviations

3.1 Definitions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

3.2 Symbols

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

$BW_{Channel}$	Channel bandwidth, defined in TS 36.101 subclause 3.2
$BW_{Channel\_CA}$	Aggregated channel bandwidth, expressed in MHz, defined in TS 36.101 subclause 3.2.
CPICH_Ec	Average energy per PN chip for the CPICH
CPICH_Ec/Io	The ratio of the received energy per PN chip for the CPICH to the total received power spectral density at the UE antenna connector.
Ec	Average energy per PN chip
Ês	Received energy per RE (power normalized to the subcarrier spacing) during the useful part of the symbol, i.e. excluding the cyclic prefix, at the UE antenna connector
Io	The total received power density, including signal and interference, as measured at the UE antenna connector.
Ioc	The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.
Iot	The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector
N_{oc}	The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as measured at the UE antenna connector
n_{PRB}	Physical Resource Block number as defined in subclause 3.1 in 3GPP TS 36.211.

P_{CMAX}	Configured UE transmitted power as defined in subclause 6.2.5 in 3GPP TS 36.101.
$Q_{\text{out\_Cat M1}}$	Defined in TS36.133 clause 7.19.2
$Q_{\text{in\_Cat M1}}$	Defined in TS36.133 clause 7.19.2
S	Defined in TS 36.304, subclause 5.2.3.2 for E-UTRAN
SCH_Ec/Ior	The ratio of the transmit energy per PN chip of the SCH to the total transmit power spectral density at the UTRA Node B antenna connector
SCH_RP	Received (linear) average power of the resource elements that carry E-UTRA synchronisation signal, measured at the UE antenna connector
$S_{\text{ServingCcell}}$	Defined in TS 36.304
Sintersearch	Defined in TS 25.304, subclause 5.2.6.1.5
Sintrasearch	Defined in TS 25.304, subclause 5.2.6.1.5 for UTRAN and in TS 36.304, subclause 5.2.4.7 for E-UTRAN
Snonintrasearch	Defined in TS 36.304, subclause 5.2.4.7
SsearchRAT	Defined in TS 25.304, subclause 5.2.6.1.5
$\text{Thresh}_{\text{x, high}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Thresh}_{\text{x, low}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Thresh}_{\text{serving, low}}$	Defined in TS 36.304, subclause 5.2.4.7
$T_{\text{RE-ESTABLISH-REQ}}$	The RRC Re-establishment delay requirement, the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH.
Treselection	Defined in TS 25.304, subclause 5.2.6.1.5
$\text{Treselection}_{\text{RAT}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Treselection}_{\text{EUTRAN}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Treselection}_{\text{UTRAN}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Treselection}_{\text{GERAN}}$	Defined in TS 36.304, subclause 5.2.4.7
T_S	Basic time unit, defined in TS 36.211, clause 4

3.3 Abbreviations

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

1x RTT	CDMA2000 1x Radio Transmission Technology
ABS	Almost Blank Subframe
ARQ	Automatic Repeat Request
AWGN	Additive White Gaussian Noise
BCCH	Broadcast Control Channel
BCH	Broadcast Channel
BS	Base Station
BSIC	Base transceiver Station Identity Code
CA	Carrier Aggregation
CC	Component Carriers
CCCH SDU	Common Control Channel SDU
CCTrCH	Coded Composite Transport Channel
CFN	Connection Frame Number
CPICH	Common Pilot Channel
CPICH Ec/No	CPICH received energy per chip divided by the power density in the band
CRS	Cell-specific Reference Signals
C-RNTI	Cell RNTI
CQI	Channel Quality Indicator
CSI	Channel-State Information
CSI-RS	CSI Reference Signal
DC	Dual Connectivity
DCI	Downlink Control Information
DCCH	Dedicated Control Channel
DL	Downlink
DPCH	Dedicated Physical Channel
DPCCH	Dedicated Physical Control Channel
DRX	Discontinuous Reception
DTX	Discontinuous Transmission

DwPTS	Downlink Pilot Time-Slot
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
EPRE	Energy Per Resource Element
eICIC	Enhanced Inter-Cell Interference Coordination
E-UTRA	Evolved UMTS Terrestrial Radio Access
E-UTRAN	Evolved UMTS Terrestrial Radio Access Network
FDD	Frequency Division Duplex
FeICIC	Further Enhanced Inter-Cell Interference Coordination
FGI	Feature Group Indicator
FRC	Fixed Reference Channel
GSM	Global System for Mobile communication
HARQ	Hybrid Automatic Repeat Request
HD-FDD	Half- Duplex FDD
HO	Handover
HRPD	High Rate Packet Data
ICIC	Inter-Cell Interference Coordination
MAC	Medium Access Control
MCG	Master Cell Group
MeNB	Master eNB
MBSFN	Multimedia Broadcast multicast service Single Frequency Network
MBSFN ABS	MBSFN Almost Blank Subframe
MDT	Minimization of Drive Tests
MIB	Master Information Block
OCNG	OFDMA Channel Noise Generator
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
OTDOA	Observed Time Difference of Arrival
PBCH	Physical Broadcast Channel
PCC	Primary Component Carrier
PCCH	Paging Control Channel
P-CCPCH	Primary Common Control Physical Channel
PCell	Primary Cell
PCFICH	Physical Control Format Indicator Channel
PDCCH	Physical Downlink Control Channel
PDSCH	Physical Downlink Shared Channel
PHICH	Physical Hybrid ARQ Indicator Channel
PLMN	Public Land Mobile Network
PMI	Precoding Matrix Indicator
PRACH	Physical Random Access Channel
PSCell	Primary SCell
PSS	Primary Synchronization Signal
PSS_RA	PSS-to-EPRE ratio for the channel PSS
psTAG	Primary Secondary Timing Advance Group
pTAG	Primary Timing Advance Group
PUCCH	Physical Uplink Control Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RAT	Radio Access Channel
REFSENS	Reference Sensitivity power level
RLC	Radio Link Control
RMC	Reference Measurement Channel
r.m.s	Root Mean Square
RNC	Radio Network Controller
RNTI	Radio Network Temporary Identifier
RRC	Radio Resource Control
RRM	Radio Resource Management
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
RSSI	Received Signal Strength Indicator
SCC	Secondary Component Carrier
SCH	Synchronization Channel
SCell	Secondary Cell

SDU	Service Data Unit
SFN	System Frame Number
SNR	Signal-to-Noise Ratio
SON	Self Organizing Network
SRS	Sounding Reference Signal
SSS	Secondary Synchronization Signal
SSS_RA	SSS-to-RS EPRE ratio for the channel SSS
sTAG	Secondary Timing Advance Group
TAG	Timing Advance Group
TDD	Time Division Duplex
TTI	Transmission Time Interval
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UpPTS	Uplink Pilot Time-Slot
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network
V2V	Vehicle to Vehicle
V2X	Vehicle to Everything
WB-RSRQ	Wide Bandwidth RSRQ

3.4 Void

3.5 Additional notation

3.5.1 Groups of bands

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

Table 3.5.1-1: E-UTRA band groups

Group	E-UTRA FDD		E-UTRA TDD		E-UTRA Frame Structure 3	
	Band group notation	Operating bands	Band group notation	Operating bands	Band group notation	Operating bands
A	FDD_A	1, 4, 6, 10, 11, 18, 19, 21, 23, 24, 32 Note 2, 67Note 2, 69Note 2, 70Note 7	TDD_A	33, 34, 35, 36, 37, 38, 39, 40, 45	FS3_A	-
B	FDD_B	65, 66 Note 5	TDD_B	-	FS3_B	-
C	FDD_C	9, 30	TDD_C	42, 43, 48	FS3_C	-
D	FDD_D	28	TDD_D	-	FS3_D	-
E	FDD_E	2, 5, 7, 27	TDD_E	41, 44	FS3_E	-
F	FDD_F	26 Note 3	TDD_F	-	FS3_F	-
G	FDD_G	3, 8, 12, 13, 14, 17, 20, 22, 29 Note 2	TDD_G	47 Note4	FS3_G	46 Note 2
H	FDD_H	25	TDD_H	-	FS3_H	-
I	FDD_I	-	TDD_I	-	FS3_I	-
J	FDD_J	-	TDD_J	-	FS3_J	-
K	FDD_K	-	TDD_K	-	FS3_K	-
L	FDD_L	-	TDD_L	-	FS3_L	-
M	FDD_M	-	TDD_M	-	FS3_M	-
N	FDD_N	31	TDD_N	-	FS3_N	-
NOTE 1: The bands within the same group have the same Io conditions in a corresponding requirement in this specification. NOTE 2: This band is used only for E-UTRA carrier aggregation with other E-UTRA bands. NOTE 3: The minimum Io condition for Band 26 is reduced by 0.5 dB when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 4: This band is used only for V2V operation. NOTE 5: The range 2180-2200 MHz of the DL operating band 66 is restricted to E-UTRA operation when carrier aggregation is configured. NOTE 6: Void NOTE 7: The range 2010-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 300 MHz The range 2005-2020 MHz of the DL operating band is restricted to E-UTRA operation when carrier aggregation is configured and TX-RX separation is 295 MHz						

3A Requirements for support of RRM

3A.1 General

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

- Idle mode, the cell re-selection algorithms that are controlled by the setting of parameters (thresholds and hysteresis values) that define the best cell and/or determine when the UE should select a new cell

- The configuration of the UE measurement and reporting procedures that are transmitted via dedicated signalling in connected mode

- Connected mode, the mobility of radio connections that has to be supported

- Handover decisions that may be based on UE or eNB measurements

- Inter-RAT RRM, the management of radio resources in connection with inter-RAT mobility, e.g. Inter-RAT handover

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

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

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

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

3A.2 Requirements Classification for Statistical Testing

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

3A.3 RRM Test Configurations

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

3A.3.1 UE with Single or Multiple Antenna Connector

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

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

3A.3.2 Test configuration for Inter band test cases

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

3A.3.3 Test configuration for Inter RAT test cases

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

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

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

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

3A.3.4 UE with Multiband Capability

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

3A.3.5 E-UTRAN operating band configuration

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

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

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

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

3A.3.6 CA configuration

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

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

CA Configuration	PCC-SCC mapping	Notes
Intra-band CA	CC1-CC2	1
Inter-band CA (CA_x-y)	Bx-By (if not supported by the UE, then By-Bx)	2
NOTE 1: Notation CCi-CCj means PCC on component carrier CCi and SCC on component carrier CCj, with CCi/j frequencies defined in the corresponding intra-band contiguous / non-contiguous CA band in TS36.508. NOTE 2: Notation Bi–Bj means PCC on component Band i and SCC on component Band j, with single Band i/j frequencies defined in TS36.508.		

3A.3.7 HD-FDD category 0 testing

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

3A.4 Antenna Configuration

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

3A.4.1 Antenna connection for 4 Rx capable UEs

3A.4.1.1 Introduction

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

3A.4.1.2 Principle of testing

3A.4.1.2.1 Single carrier tests

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

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

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

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

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

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

3A.4.1.2.2 Carrier aggregation and Dual connectivity tests

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

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

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

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

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

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

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

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

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

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

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

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

3A.5.1 Introduction

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

3A.5.2 Principle of Testing

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

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

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

3A.6.1 Introduction

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

3A.6.2 Principle of testing

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

4 E-UTRAN RRC_IDLE State Mobility

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

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

4.1 E-UTRAN Cell Selection

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

4.2 E-UTRAN Cell Re-Selection

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

4.2.1.1 Test purpose

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

4.2.1.2 Test applicability

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

4.2.1.3 Minimum conformance requirements

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

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

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

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

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

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

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

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

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

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

- Intra-frequency carrier

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

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

4.2.1.4 Test description

4.2.1.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

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

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

4. Message contents are as defined in clause 4.2.1.4.3

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

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

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

4.2.1.4.2 Test procedure

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.1.4.3 Message contents

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

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

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

4.2.1.5 Test requirement

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.2.1 Test purpose

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

4.2.2.2 Test applicability

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

4.2.2.3 Minimum conformance requirements

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

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

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

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

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

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

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

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

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

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

4.2.2.4 Test description

4.2.2.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 4.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

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

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

4.2.2.4.2 Test procedure

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

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

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.
2. Set the parameters according to T1 in Table 4.2.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.
4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.2.5-1.
5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.
6. If the UE responds on the newly detectable cell, Cell 2, during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event "Re-select newly detected Cell 2". Otherwise count a fail for the event "Re-select newly detected Cell 2".
7. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 12.
8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.2.5-1.
9. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.
10. If the UE responds on the already detected cell, Cell 1, during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event "Re-select already detected Cell 1". Otherwise count a fail for the event "Re-select already detected Cell 1".
11. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 12.
12. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events "Re-select newly detected Cell 2" and "Re-select already detected Cell 1" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.2.4.3 Message contents

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

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

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

4.2.2.5 Test requirement

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.3.1 Test purpose

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

4.2.3.2 Test applicability

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

4.2.3.3 Minimum conformance requirements

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.3.4 Test description

4.2.3.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.3.4.3.
5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

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

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

4.2.3.4.2 Test procedure

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

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

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.2.3.5-1
3. Set the parameters according to duration T1 in Table 4.2.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
4. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 1.
5. If the UE responds on lower priority cell, Cell 1 during time duration T1 within 8 seconds from the beginning of time period T1, then count a success for the event “Re-select lower priority Cell 1”. Otherwise count a fail for the event “Re-select lower priority Cell 1”.
6. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 7. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 12.
7. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.3.5-2. During time duration T2, Cell 2 shall be powered OFF and the physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) shall be changed to ensure Cell 2 is not detected by the UE.
8. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.3.5-2.
9. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 2.

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

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

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

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

4.2.3.4.3 Message contents

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

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

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

4.2.3.5 Test requirement

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

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

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.4.1 Test purpose

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

4.2.4.2 Test applicability

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

4.2.4.3 Minimum conformance requirements

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

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

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

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

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

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

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

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

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

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

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

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

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

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

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

4.2.4.4 Test description

4.2.4.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.4.4.3.
5. There are two E-UTRA carriers and two cells specified in the test. One E-UTRA FDD Cell 1 is the neighbour cell on the FDD carrier frequency, One E-UTRA TDD Cell 2 is the cell on the TDD carrier frequency and is used for registration with the power level set according to Annex C.0 and C.1 for this test.

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

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

4.2.4.4.2 Test procedure

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

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

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

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

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

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

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

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

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

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

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

4.2.4.4.3 Message contents

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

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

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

4.2.4.5 Test requirement

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

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

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	10
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 FDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99.35	
RSRP Note 3	dBm/15 KHz	-103.05	-84.95
$\hat{E}_s/I_{ot}$	dB	-3.70	14.4
$\hat{E}_s/N_{oc}$	dB	-3.70	14.4
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

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

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 FDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.35					
RSRP Note 3	dBm/15 KHz	-82.95	-82.95	-82.95	-103.05	-infinity	-84.95
$\hat{E}_s/I_{ot}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$\hat{E}_s/N_{oc}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.5.1 Test purpose

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

4.2.5.2 Test applicability

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

4.2.5.3 Minimum conformance requirements

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

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

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

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

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

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

The UE shall measure RSRP or RSRQ at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ (see table 4.2.5.3-1) for identified lower or equal priority inter-frequency cells. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

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

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

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

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

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

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

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

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

4.2.5.4 Test description

4.2.5.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.5.4.3.
5. There are two E-UTRA carriers and two cells specified in the test. One E-UTRA TDD Cell 1 is the neighbour cell on the TDD carrier frequency, One E-UTRA FDD Cell 2 is the cell on the FDD carrier frequency and is used for registration with the power level set according to Annex C.0 and C.1 for this test.

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

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

4.2.5.4.2 Test procedure

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

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

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

2. Set the parameters according to duration T0 in Table 4.2.5.5-1.

3. Set the parameters according to duration T1 in Table 4.2.5.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

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

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

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

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

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

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

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

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

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

4.2.5.4.3 Message contents

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

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

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

4.2.5.5 Test requirement

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

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

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	10
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 FDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99.35	
RSRP Note 3	dBm/15 KHz	-103.05	-84.95
$\hat{E}_s/I_{ot}$	dB	-3.70	14.40
$\hat{E}_s/N_{oc}$	dB	-3.70	14.40
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

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

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD) and D.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99.35					
RSRP Note 3	dBm/15 KHz	-82.95	-82.95	-82.95	-103.05	-infinity	-84.95
$\hat{E}_s/I_{ot}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$\hat{E}_s/N_{oc}$	dB	16.40	16.40	16.40	-3.70	-infinity	14.40
$Treselection_{EUTRAN}$	s	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.6.1 Test purpose

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

4.2.6.2 Test applicability

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

4.2.6.3 Minimum conformance requirements

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.6.4 Test description

4.2.6.4.1 Initial conditions

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

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

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

1. Connect the SS (eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.6.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to clause C.0 and C.1for this test.

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

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

4.2.6.4.2 Test procedure

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

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

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

2. Set the parameters according to duration T0 in Table 4.2.6.5-1

3. Set the parameters according to duration T1 in Table 4.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

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

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

7. The SS shall switch the power setting from T1 to T2 as specified in Table 4.2.6.5-2. During time duration T2, Cell 2 shall be powered OFF and change Cell 2 physical cell identity to ((current cell 2 physical cell identity + 1) mod 14 + 2) to ensure Cell 2 is not detected by the UE.

8. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.6.5-2.

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

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

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

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

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

4.2.6.4.3 Message contents

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

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

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

4.2.6.5 Test requirement

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.7.1 Test purpose

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

4.2.7.2 Test applicability

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

4.2.7.3 Minimum conformance requirements

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.7.4 Test description

4.2.7.4.1 Initial conditions

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

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

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

The UE's allowed CSG list is empty.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.27.
2. The general test parameter settings are set up according to Table 4.2.7.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.7.4.3.
5. There are two E-UTRA FDD carriers and two cells specified in the test and one non-allowed E-UTRA FDD CSG cell. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test and Cell 3 is the cell used for adding interference from non-allowed CSG cell.

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

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

4.2.7.4.2 Test procedure

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.7.4.3 Message contents

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

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

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

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

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

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

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

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

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

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

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

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

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

4.2.7.5 Test requirement

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

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

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

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

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

Parameter	Unit	Cell 1			Cell 2			Cell 3(Non-allowed CSG cell)		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			1		
$BW_{channel}$	MHz	10			10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
Qrxlevmin	dBm	-140			-140			-140		
Qqualmin	dB	-20								
N_{oc} Note 2	dBm/15 kHz	-98								
RSRP Note 3	dBm/15 kHz	-90.20	-90.0	-85.00	-Infinity	-85.00	-90.00	-90.00	-85.00	-60.00
RSRQ Note 3	dB	-14.24	-17.15	-35.81	-Infinity	-11.00	-11.43	-14.04	-12.15	-10.81
$\hat{E}_s/I_{ot}$	dB	-0.84	-5.21	-25.00	-Infinity	13.00	8.00	-0.47	4.36	24.79
$\hat{E}_s/N_{oc}$	dB	7.80	8.00	13.00	-Infinity	13.00	8.00	8.00	13.00	38.00
Treselection	s	0			0			0		
SnonintrasearchQ	dB	10			Not sent			Not sent		
Propagation Condition		AWGN								
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.										

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

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

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

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

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

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

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be at least 90%.

The probability of re-selection from Cell 2 to Cell 1 during T3 observed during testing shall be less than 10%.

For the test to pass, both events above shall pass with a confidence level of 95%.

4.2.8 E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

4.2.8.1 Test purpose

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

4.2.8.2 Test applicability

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

4.2.8.3 Minimum conformance requirements

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

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

If Srxlev > $S_{nonIntraSearchP}$ and Squal > $S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 4.2.2 of TS 36.133 [4].

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

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

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

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

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

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

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

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

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

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

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.8.

4.2.8.4 Test description

4.2.8.4.1 Initial conditions

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

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

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

The UE's allowed CSG list is empty.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.27.
2. The general test parameter settings are set up according to Table 4.2.8.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.8.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test and one non-allowed E-UTRA TDD CSG cell. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test and Cell 3 is the cell used for adding interference from non-allowed CSG cell.

Table 4.2.8.4.1-1: General test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA RF Channel Number			1, 2	Two TDD carrier frequencies are used.
Time offset between cells		µs	3	Synchronous cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that the non-allowed CSG cell is identified.
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that whether cell re-selection would not occur is insured.

4.2.8.4.2 Test procedure

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

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

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

2. Set the parameters according to duration T0 in Table 4.2.8.5-1. If the UE is already camped in Cell 1, wait until T0 expires and skip to step 5.

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

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

5. Set the parameters according to duration T1 in Table 4.2.8.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.8.5-2. T2 starts.

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

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

10. After the re-selection or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.8.5-2. T3 starts.

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

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

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

4.2.8.4.3 Message contents

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

Table 4.2.8.4.3-1: Common Exception messages for E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

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

Table 4.2.8.4.3-2: *SystemInformationBlockType1*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

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

Table 4.2.8.4.3-3: *SystemInformationBlockType3*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

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

Table 4.2.8.4.3-4: *SystemInformationBlockType4*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

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

Table 4.2.8.4.3-5: *SystemInformationBlockType5*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

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

Table 4.2.8.4.3-6: *SystemInformationBlockType9*: E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell

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

4.2.8.5 Test requirement

Tables 4.2.8.4.1-1, 4.2.8.5-1 and 4.2.8.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.8.5-1: Cell specific Test requirement parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1	Cell 2	Cell 3
		T0		
E-UTRA RF Channel number		1	2	1
$BW_{channel}$	MHz	10	10	10
OCNG Patterns defined in D.2.2		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
Qrxlevmin	dBm	-140	-140	-140
Qqualmin	dB	-20	-20	-20
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-85.00	-101.00	-Infinity
RSRQ Note 3	dB	-11.00	-15.56	-Infinity
$\hat{E}_s/I_{ot}$	dB	13.00	-3.00	-Infinity
$\hat{E}_s/N_{oc}$	dB	13.00	-3.00	-Infinity
Treselection	s	0	0	0
SnonintrasearchQ	dB	10	Not sent	Not sent
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and RSRQ and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 4.2.8.5-2: Cell specific test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1			Cell 2			Cell 3 (Non-allowed CSG cell)		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			1		
$BW_{channel}$	MHz	10			10			10		
OCNG Pattern defined in D..2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
Qrxlevmin	dBm	-140			-140			-140		
Qqualmin	dB	-20								
N_{oc} Note 2	dBm/15kHz	-98								
RSRP Note 3	dBm/15kHz	-90.20	-90.00	-85.00	-Infinity	-85.00	-90.00	-90.00	-85.00	-60.00
RSRQ Note 3	dB	-14.24	-17.15	-35.81	-Infinity	-11.00	-11.43	-14.04	-12.15	-10.81
$\hat{E}_s/I_{ot}$	dB	-0.84	-5.21	-25.00	-Infinity	13.00	8.00	-0.47	4.36	24.79
$\hat{E}_s/N_{oc}$	dB	7.80	8.00	13.00	-Infinity	13.00	8.00	8.00	13.00	38.00
Treselection	S	0			0			0		
SnonintrasearchQ	dB	10			Not sent			Not sent		
Propagation Condition		AWGN								
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.										

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

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

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

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

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

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

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be at least 90%.

The probability of re-selection from Cell 2 to Cell 1 during T3 observed during testing shall be less than 10%.

For the test to pass, both events above shall pass with a confidence level of 95%.

4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth

4.2.9.1 Test purpose

Same test purpose as in clause 4.2.1.1.

4.2.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE Release 8 and forward and only support E-UTRA Band 31.

4.2.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.1.3 with the following exceptions:

- Instead of A.4.2.1 → use A.4.2.9.

4.2.9.4 Test description

4.2.9.4.1 Initial conditions

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

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

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 4.2.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.9.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra cell re-selection test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 4.2.1.4.1-1 for the other parameters. Note 2: This is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

4.2.9.4.2 Test procedure

Same test procedure as in clause 4.2.1.4.2 with the following exceptions:

- Instead of Table 4.2.1.5-1 → use Table 4.2.9.5-1.

4.2.9.4.3 Message contents

Same message contents as in clause 4.2.1.4.3.

4.2.9.5 Test requirement

Same test requirement as in clause 4.2.1.5 with the following exceptions:

Tables 4.2.9.4.1-1 and 4.2.9.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency cell re-selection test case.

Table 4.2.9.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN for 5MHz

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5			5		
OCNG Patterns defined in D.1.16 (OP.16 FDD)		OP.16 FDD			OP.16 FDD		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table 4.2.1.5-1 for the other parameters.							

4.2.12 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage

4.2.12.1 Test purpose

To verify for a category M1 UE that when the current and target cell operates on the same carrier frequency in normal coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1.

4.2.12.3 Minimum conformance requirements

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

The CAT-M1 UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The CAT-M1 UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,\ EUTRAN\_Intra}$ as defined in Table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked.

The CAT-M1 UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in Table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The CAT-M1 UE shall filter RSRP measurement of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}$ / 2.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the CAT-M1 UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluateFDD,Intra}$ as defined in Table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for re-selection, the side conditions are RSRP and SCh apply to both serving and non-serving intra-frequency cells.

If $T_{reselection}$ timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the CAT-M1 UE shall evaluate this intra-frequency cell for the $T_{reselection}$ time. If this cell remains better ranked within this duration, then the CAT-M1 UE shall re-select that cell.

The CAT-M1 UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $T_{reselection}$ is used, the CAT-M1 UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $T_{reselection}$ timer.

At intra-frequency cell re-selection, the CAT-M1 UE shall monitor the downlink of serving cell for paging reception until the CAT-M1 UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the CAT-M1 UE shall be capable of monitoring at least:

- Intra-frequency carrier

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a CAT-M1 UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.12.

4.2.12.4 Test description

4.2.12.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 4.2.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.12.4.3.
5. There is one E-UTRA FD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.12.4.1-1: General test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			PRACH_2CE	Refer to A.9
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.12.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The CAT-M1 UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the CAT-M1 UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, the CAT-M1 UE has not registered with network for the tracking area containing Cell 2.

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

1. Ensure the CAT-M1 UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.12.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.12.5-1.

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

6. If the CAT-M1 UE responds on the newly detectable cell, Cell 2 during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event "Re-select newly detected Cell 2". Otherwise count a fail for the event "Re-select newly detected Cell 2".

7. If the CAT-M1 UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the CAT-M1 UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.12.5-1.

9. The SS waits for random access requests information from the CAT-M1 UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the CAT-M1 UE responds on the already detected cell, Cell 1 during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the CAT-M1 UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the CAT-M1 UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the CAT-M1 UE and ensure the UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2A in Cell 1.

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

4.2.12.4.3 Message contents

Message contents are according to 3GPP TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.12.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2

Table 4.2.12.4.3-2: *PRACH-Config-DEFAULT*: E-UTRAN FDD cell re-selection and handover

Derivation Path: 3GPP TS 36.508 [7] clause 4.6.3, Table 4.6.3-7A PRACH-Config-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
prach-ParametersListCE-r13 SEQUENCE {			
prach-ConfigIndex-r13[1]	4		
}			

4.2.12.5 Test requirement

Tables 4.2.12.4.1-1 and 4.2.12.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.12.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s, n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	16	13	16.45	-infinity	16.45	13
$\hat{E}_s/I_{ot}$	dB	16	-3.55	3.24	-infinity	3.24	-3.55
RSRP Note3	dBm/15 kHz	-82	-85	-81.55	-infinity	-81.55	-85
Treselection	S	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1	ms	-			3		

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

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

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

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

The cell re-selection delay to an already detected cell shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

4.2.13 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage

4.2.13.1 Test purpose

To verify for a category M1 UE that when the current and target cell operates on the same carrier frequency in normal coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.13.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1.

4.2.13.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.12.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.13.

4.2.13.4 Test description

4.2.13.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 4.2.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.12.4.3
5. There is one E-UTRA HD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.13.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			PRACH_2CE	Refer to A.9
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.13.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The CAT-M1 UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the CAT-M1 UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, the CAT-M1 UE has not registered with network for the tracking area containing Cell 2.

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

1. Ensure the CAT-M1 UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.13.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.13.5-1.

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

6. If the CAT-M1 UE responds on the newly detectable cell, Cell 2 during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the CAT-M1 UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the CAT-M1 UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.13.5-1.

9. The SS waits for random access requests information from the CAT-M1 UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the CAT-M1 UE responds on the already detected cell, Cell 1 during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the CAT-M1 UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the CAT-M1 UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the CAT-M1 UE and ensure the UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2A in Cell 1.

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

4.2.13.4.3 Message contents

Same message contents as in clause 4.2.12.4.3.

4.2.13.5 Test requirement

Tables 4.2.13.4.1-1 and 4.2.13.5-1 defines the primary level settings including test tolerances for E-UTRAN HD FDD – FDD Intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.13.5-1: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	16	13	16.45	-infinity	16.45	13
$\hat{E}_s/I_{ot}$	dB	16	-3.55	3.24	-infinity	3.24	-3.55
RSRP Note3	dBm/15 kHz	-82	-85	-81.55	-infinity	-81.55	-85
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1	ms	-			3		

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

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

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

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

The cell re-selection delay to an already detected cell shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in TS 36.133 [4] clause 4.2.2.3

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

4.2.14 E-UTRAN TDD – TDD Intra frequency case for Cat-M1 UE in normal coverage

4.2.14.1 Test purpose

To verify for a category M1 UE that when the current and target cell operates on the same carrier frequency in normal coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1.

4.2.14.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.12.3.The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.14.

4.2.14.4 Test description

4.2.14.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 4.2.14.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.14.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.14.4.1-1: General test parameters for TDD intra frequency cell re-selection test case for Cat-M1 UE

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211
PRACH Configuration			PRACH 2CE	Refer to A.9
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.14.4.2 Test procedure

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

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

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

2. Set the parameters according to T1 in Table 4.2.14.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.14.5-1.

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

6. If the Cat-M1 UE responds on the newly detectable cell, Cell 2, during time duration T2 within 34 seconds from the beginning of time period T2, then count a success for the event "Re-select newly detected Cell 2". Otherwise count a fail for the event "Re-select newly detected Cell 2".

7. If the Cat-M1 UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8.
   Otherwise, if T2 expires and the Cat-M1 UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.14.5-1.

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

10. If the Cat-M1 UE responds on the already detected cell, Cell 1, during time duration T3 within 8 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the Cat-M1 UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the Cat-M1 UE has not yet re-selected Cell 1, continue with step 12.

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

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

4.2.14.4.3 Message contents

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

Table 4.2.14.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2

Table 4.2.14.4.3-2: *PRACH-Config-v1310-DEFAULT*: E-UTRAN TDD cell re-selection and handover

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	1 entry		
RSRP-Range[1]	42	-99dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	2 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
prach-ConfigIndex-r13[2]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf128		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
}			
}			

4.2.14.5 Test requirement

Tables 4.2.14.4.1-1, and 4.2.14.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.14.5-1: Cell specific test parameters for TDD intra frequency cell re-selection test case for Cat-M1 UE in AWGN in normal coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	16.00	13.00	16.45	-infinity	16.45	13.00
$\hat{E}_s/I_{ot}$	dB	16.00	-3.55	3.24	-infinity	3.24	-3.55
RSRP Note3	dBm/15 kHz	-82.00	-85.00	-81.55	-infinity	-81.55	-85.00
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Cell 1	μs	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

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

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

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

The cell re-selection delay shall be less than 8 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI-EUTRA}$, and to an already detected cell can be expressed as: $T_{evaluate,\ E-UTRAN\_\ intra} + T_{SI-EUTRA}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3 of TS 36.133 [4]

$T_{evaluate,EUTRAN\_ intra}$ See Table 4.2.2.3-1 in clause 4.2.2.3 of TS 36.133 [4]

$T_{SI-EUTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

4.2.15 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage

4.2.15.1 Test purpose

To verify for a category M1 UE that when the current and target cell operates on the same carrier frequency in enhanced coverage the UE is able to search and measure cells to meet the respective intra-frequency cell re-selection requirements.

4.2.15.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

4.2.15.3 Minimum conformance requirements

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

The requirements for enhanced coverage in idle mode shall apply provided the UE category M1 with the radio condition that SCH Ês/Iot ≥ -15 dB and CRS Ês/Iot ≥ -15 dB. The CAT-M1 UE is considered to be in enhanced coverage area of neighbour cell according to RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot of the neighbour cell defined in Annex B.1.3 of TS36.133[4] for a corresponding Band.

The CAT-M1 UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities. The UE shall not cause any interruption to the paging reception and acquisition of SI while performing measurement on serving or any neighbour cells.

The CAT-M1 UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304[6] within $T_{detect,EUTRAN\_Intra\_EC}$ when that Treselection= 0 .

The CAT-M1 UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra\_EC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

The CAT-M1 UE shall filter RSRP measurements of each measured intra-frequency cell using at least 4 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra\_EC}/2$.

The CAT-M1 UE shall not consider an E-UTRA neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined in TS36.304[6] within $T_{evaluate,E-UTRAN\_intra\_EC}$ when $T_{reselection}$ = 0, provided that the cell is at least $\Delta_{dB-ranking}$ better ranked and additional conditions Table 4.2.15.3-2 are met, where $\Delta_{dB-ranking}$ is according to Table 4.2.15.3-3. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

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

For UE not configured with eDRX_IDLE cycle, $T_{detect,EUTRAN\_Intra\_EC}$, $T_{measure,EUTRAN\_Intra\_EC}$ and $T_{evaluate, E\text{-}UTRAN\_intra\_EC}$ are specified in Table 4.2.15.3-1 provided that additional conditions Table 4.2.15.3-2 are met.

Table 4.2.15.3-1: $T_{detect,EUTRAN\_Intra\_EC}$, $T_{measure,EUTRAN\_Intra\_EC}$ and $T_{evaluate, E\text{-}UTRAN\_intra\_EC}$

DRX cycle length [s]	$T_{detect,EUTRAN\_Intra\_EC}$ [s] (number of DRX cycles)	$T_{measure,EUTRAN\_Intra\_EC}$ [s] (number of DRX cycles)	$T_{evaluate,E\text{-}UTRAN\_intra\_EC}$ [s] (number of DRX cycles)
0.32	330.24 (1032)	1.28 (4)	10.24 (32)
0.64	330.24 (516)	1.28 (2)	10.24 (16)
1.28	524.8 (410)	1.28 (1)	12.8 (10)
2.56	1039.36 (406)	2.56 (1)	15.36 (6)

Table 4.2.15.3-2: Conditions on SCH Ês/Iot of identified and of the neighbour cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	$T_{detect,EUTRAN\_Intra,\ ca\ tM1}$ (S)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in Table 4.2.2.11.2-1 of TS 36.133 [4]
-15≤Q1<-6	Q2≥-6	Requirements in clause 4.2.2 of TS 36.133 [4] apply
Q1≥ -6	Q2≥-6	Requirements clause in 4.2.2 of TS 36.133 [4] apply

Table 4.2.15.3-3: $\Delta_{dB\text{-}ranking}$ based on SCH Ês/Iot of identified and of the neighbour cell

SCH Ês/Iot of serving cell: Q1	SCH Ês/Iot of Neighbouring cell: Q2	$\Delta_{dB\text{-}ranking}$ (dB)
-15≤Q1<-6	-15≤ Q2 < -6	5
-15≤Q1<-6	Q2≥-6	5
Q1≥ -6	Q2≥-6	4

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.11 and A.4.2.15.

4.2.15.4 Test description

4.2.15.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 4.2.15.4.1-1.

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

4. Message contents are as defined in clause 4.2.15.4.3.

5. There is one E-UTRA FD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.15.4.1-1: General test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Parameters			PRACH_4CE	Refer to A.9
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.15.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The CAT-M1 UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the CAT-M1 UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, the CAT-M1 UE has not registered with network for the tracking area containing Cell 2.

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

1. Ensure the CAT-M1 UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.15.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.15.5-1.

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

6. If the CAT-M1 UE responds on the newly detectable cell, Cell 2 during time duration T2 within 338 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the CAT-M1 UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the CAT-M1 UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.15.5-1.

9. The SS waits for random access requests information from the CAT-M1 UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the CAT-M1 UE responds on the already detected cell, Cell 1 during time duration T3 within 18 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the CAT-M1 UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the CAT-M1 UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the CAT-M1 UE and ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A in Cell 1.

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

4.2.15.4.3 Message contents

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

Table 4.2.15.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2

Table 4.2.15.4.3-2: *PRACH-Config-DEFAULT*: E-UTRAN FDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7A PRACH-Config-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
prach-ParametersListCE-r13 SEQUENCE {			
prach-ConfigIndex-r13[1]	4		
}			

4.2.15.5 Test requirement

Tables 4.2.15.4.1-1 and 4.2.15.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD – FDD Intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.15.5-1: Cell specific test parameters for FDD intra frequency cell reselection test case for Cat-M1 UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns defined in clause D.1.2		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s, n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	-7	-12	-6.55	-infinity	-6.55	-12
$\hat{E}_s/I_{ot}$	dB	-7	-12.87	6.82-	-infinity	-6.82	-12.87
RSRP Note3	dBm/15 kHz	-105	-110	-104.55	-infinity	-104.55	-110
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

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

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

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

The cell re-selection delay to an already detected cell shall be less than 18 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra\_EC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ E\text{-}UTRAN\_intra\_EC} + T_{SI}$.

Where:

$T_{detect,EUTRAN\_Intra\_EC}$ See Table 4.2.15.3-1

$T_{evaluate,\ E\text{-}UTRAN\_intra\_EC}$ See Table 4.2.15.3-11

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell and 17.36 s, allow 18 s for the cell re-selection delay to an already detected cell in the test case.

4.2.16 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage

4.2.16.1 Test purpose

To verify for a category M1 UE in enhanced coverage that the UE is able to search and measure cells to meet the respective HD-FDD intra-frequency cell re-selection requirements.

4.2.16.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

4.2.16.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.15.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.11 and A.4.2.16.

4.2.16.4 Test description

4.2.16.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 4.2.12.4.1-1.

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

4. Message contents are as defined in clause 4.2.12.4.3

5. There is one E-UTRA HD-FDD cell (Cell 1) and one E-UTRA FDD cell (Cell 2) specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.16.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in enhanced coverage

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Parameters			PRACH_4CE	Refer to A.3.16 in TS 36.133 [4]
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.16.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The CAT-M1 UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the CAT-M1 UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, the CAT-M1 UE has not registered with network for the tracking area containing Cell 2.

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

1. Ensure the CAT-M1 UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.16.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.16.5-1.

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

6. If the CAT-M1 UE responds on the newly detectable cell, Cell 2 during time duration T2 within 338 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the CAT-M1 UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8. Otherwise, if T2 expires and the CAT-M1 UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.16.5-1.

9. The SS waits for random access requests information from the CAT-M1 UE to perform cell re-selection to an already detected cell, Cell 1.
10. If the CAT-M1 UE responds on the already detected cell, Cell 1 during time duration T3 within 18 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.
11. If the CAT-M1 UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the CAT-M1 UE has not yet re-selected Cell 1, continue with step 12.
12. Switch off and on the CAT-M1 UE and ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A in Cell 1.
13. Repeat step 2-12 until a test verdict has been achieved.
    Each of the events “Re-select newly detected Cell 2” and “Re-select already detected Cell 1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.2.16.4.3 Message contents

Same message contents as in clause 4.2.15.4.3.

4.2.16.5 Test requirement

Tables 4.2.16.4.1-1 and 4.2.16.5-1 defines the primary level settings including test tolerances for E-UTRAN HD FDD – FDD Intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.16.5-1: Cell specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-M1 UE in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	-7	-12	-6.55	-infinity	-6.55	-12
$\hat{E}_s/I_{ot}$	dB	-7	-12.87	-6.82	-infinity	-6.82	-12.87
RSRP Note3	dBm/15 kHz	-105	-110	-104.55	-infinity	-104.55	-110
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		

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

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

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

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

The cell re-selection delay to an already detected cell shall be less than 18 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra}$ + T_{SI}, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra}$ + T_{SI},

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell and 17.36 s, allow 18 s for the cell re-selection delay to an already detected cell in the test case.

4.2.17 E-UTRAN TDD – TDD Intra frequency case for Cat-M1 UE in enhanced coverage

4.2.17.1 Test purpose

To verify for a category M1 UE in enhanced coverage that the UE is able to search and measure cells to meet the respective TDD-TDD intra-frequency cell re-selection requirements.

4.2.17.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

4.2.17.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.2.15.3.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.11 and A.4.2.17.

4.2.17.4 Test description

4.2.17.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 4.2.17.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.17.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.17.4.1-1: General test parameters for TDD intra frequency cell re-selection test case for Cat-M1 UE

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211
PRACH Parameters			PRACH_4CE	Refer to A.3.16 in TS 36.133 [4]
DRX cycle length		s	0.64	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	≤340	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	≤20	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.17.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The CAT-M1 UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier. In the test there are three successive time periods, with time duration of T1, T2, and T3 respectively. Only Cell 1 is already identified by the CAT-M1 UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, CAT-M1 UE has not registered with network for the tracking area containing Cell 2.

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

1. Ensure the CAT-M1 UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.17.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.17.5-1.

5. The SS waits for random access requests information from the CAT-M1 UE to perform cell re-selection to a newly detectable cell, Cell 2.

6. If the Cat-M1 UE responds on the newly detectable cell, Cell 2, during time duration T2 within 338 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Cell 2”. Otherwise count a fail for the event “Re-select newly detected Cell 2”.

7. If the Cat-M1 UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 8.
   Otherwise, if T2 expires and the Cat-M1 UE has not yet re-selected Cell 2, skip to step 12.

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.17.5-1.

9. The SS waits for random access requests information from the CAT-M1 UE to perform cell re-selection to an already detected cell, Cell 1.

10. If the Cat-M1 UE responds on the already detected cell, Cell 1, during time duration T3 within 18 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Cell 1”. Otherwise count a fail for the event “Re-select already detected Cell 1”.

11. If the Cat-M1 UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 13. Otherwise, if T3 expires and the Cat-M1 UE has not yet re-selected Cell 1, continue with step 12.

12. Switch off and on the CAT-M1 UE and ensure the UE is in State 2A-RF-CE with condition CEModeB according to TS 36.508 [7] clause 7.2A.2A in Cell 1.

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

4.2.17.4.3 Message contents

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

Table 4.2.17.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2

Table 4.2.17.4.3-2: *PRACH-Config-v1310-DEFAULT*: E-UTRAN TDD cell re-selection and handover

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	1 entry		
RSRP-Range[1]	42	-99dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	2 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
prach-ConfigIndex-r13[2]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf128		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
}			
}			

4.2.17.5 Test requirement

Tables 4.2.17.4.1-1, and 4.2.17.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency case for Cat-M1 cell re-selection test case.

Table 4.2.17.5-1: Cell specific test parameters for TDD intra frequency cell re-selection test case for Cat-M1 UE in AWGN in enhanced coverage

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
OCNG Patterns		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
N_{oc} Note2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	-7	-12	-6.55	-infinity	-6.55	-12
$\hat{E}_s/I_{ot}$	dB	-7	-12.87	-6.82	-infinity	-6.82	-12.87
RSRP Note3	dBm/15 kHz	-105	-110	-104.55	-infinity	-104.55	-110
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	µs	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

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

The cell re-selection delay to a newly detectable cell shall be less than 338 s.

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

The cell re-selection delay to an already detected cell shall be less than 18 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN\_Intra} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,EUTRAN\_Intra} + T_{SI}$,

Where:

$T_{detect,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

$T_{evaluate,EUTRAN\_Intra}$ See Table 4.2.2.11-1 in TS 36.133 [4] clause 4.2.2.11

T_{SI} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 6400 ms is assumed in this test case.

This gives a total of 337.36 s, allow 338 s for the cell re-selection delay to a newly detectable cell and 17.36 s, allow 18 s for the cell re-selection delay to an already detected cell in the test case.

4.2.18 HD-FDD Intra frequency cell reselection for Category NB1 UE in In-Band Mode under Normal Coverage

Editor's notes: This clause is incomplete, the following items are TBD

- *Test system uncertainty and tolerance is undefined.*
- *Connection diagram is TBD.*
- *Test requirement of TS 36.133 include bracket.*
- *Message content for SIB1 In-Band Mode is FFS.*
- *The NB-IoT PRB location in LTE cell need to be defined in TS36.508.*

4.2.18.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the Cat-NB1 UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.18.2 Test applicability

This test applies to all types of E-UTRAN HD-FDD UE release 13 and forward of UE Category NB1.

4.2.18.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,NB\_intra-NC} + T_{SI-NB}$ in RRC_IDLE state.

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

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the reselection criteria defined in TS36.304 [6] within T_{detect,NB_Intra_NC} as defined in table 4.6.2.2-1 of TS 36.133 [4] clause 4.6.2.2 when Treselection= 0 . An intra frequency cell is considered to be detectable according to NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot defined in TS 36.133 [4] Annex B.1.4 for a corresponding Band.

The UE shall measure NRSRP at least every $T_{measure,NB\_Intra\_NC}$ for intra-frequency cells that are identified and measured according to the measurement rules.

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

The UE shall not consider an NB-IoT neighbour cell in cell reselection if it is indicated as not allowed in the measurement control system information of the serving NB-IoT cell.

For an intra-frequency cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met reselection criterion defined in TS36.304

[6] within $T_{evaluate,NB\_intra-NC}$ as defined in table 4.6.2.2-1 of TS 36.133 [4] clause 4.6.2.2 when $T_{reselection}$ = 0, provided that the cell is at least 3dB better ranked. When evaluating cells for reselection, the side conditions for NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot apply to both serving and non-serving NB-IoT intra-frequency cells.

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

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

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving NB-IoT cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency and inter-frequency cell for paging reception. The interruption time shall not exceed T_{SI-NB} + 100 ms. T_{SI-NB} is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a NB-IoT cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.6.2 and A.4.2.18.

4.2.18.4 Test description

4.2.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: As specified in Table 4.2.18.5-1 and 4.2.18.5-2.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure [TBD].
2. The parameter settings for the cells are set up according to Table 4.2.18.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one NB-IoT carrier and one E-UTRA FDD carrier and three cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.18.4.1-1: General test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Ncell2	
T2 end condition	Active cell		Ncell2	
	Neighbour cells		Cell1, Ncell1	

Final condition	Visited cell		Ncell1	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH Configuration			1	Refer to Table A.10.3-1
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Ncell2 shall be powered off, and during the off time the physical cell identity shall be changed. The intention is to ensure that Ncell2 has not been detected by the UE prior to the start of period T2
T2		s	60	T2 is defined so that cell re-selection time is taken into account.
T3		s	15	T3 is defined so that cell re-selection time is taken into account.

4.2.18.4.2 Test procedure

The test scenario comprises of 1 E-UTRA carrier with one Cell and one NB-IoT carrier with 2 Ncells of different physical cell ID. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Ncell1 is already identified by the UE prior to the start of the test, i.e. Ncell 2 is not identified. Ncell 1 and Ncell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Ncell 2.

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

1. Ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Set Ncell 2 physical cell identity = initial Ncell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.18.5-1 and 4.2.18.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

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

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.18.5-1 and 4.2.18.5-2.

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

6. If the UE responds on the newly detectable cell, Ncell 2, during time duration T2 within 56.12 seconds from the beginning of time period T2, then count a success for the event “Re-select newly detected Ncell 2”. Otherwise count a fail for the event “Re-select newly detected Ncell 2”.

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

8. The SS shall switch the power setting from T2 to T3 as specified in Table 4.2.18.5-1 and 4.2.18.5-2.

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

10. If the UE responds on the already detected cell, Ncell 1, during time duration T3 within 11.62 seconds from the beginning of time period T3, then count a success for the event “Re-select already detected Ncell 1”. Otherwise count a fail for the event “Re-select already detected Ncell 1”.

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

12. Switch off and on the UE and ensure the UE is in State 3A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 7.2A.2 in Cell 1.

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

4.2.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 4.2.18.4.3-1: SystemInformationBlockType4: HD-FDD Intra frequency cell reselection for Category NB1 UE for Ncell 2

Derivation Path: TS 36.508 [7] clause 8.1.4.3.3, Table 8.1.4.3.3-3: SystemInformationBlockType4-NB			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList-r13 SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {}			
IntraFreqNeighCellInfo ::= SEQUENCE {			
physCellId	0 (Ncell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

4.2.18.5 Test requirement

Tables 4.2.18.4.1-1, 4.2.18.5-1 and 4.2.18.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency cell re-selection test case.

Table 4.2.18.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	180			180		
PRB location within Cell	-	30			30		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		NRSRP			NRSRP		
N_{oc}	dBm/15 kHz	Specified in Table 4.2.18.5-2					
$\hat{E}_s/N_{oc}$	dB	16+TT	13+TT	16+TT	-infinity	16+TT	13+TT
$\hat{E}_s/I_{ot}$ Note2	dB	16+TT	-3.11 +TT	2.79 +TT	-infinity	2.79 +TT	-3.11 +TT
NRSRP Note2	dBm/15 kHz	-82+TT	-85+TT	-82+TT	-infinity	-82+TT	-85+TT
Treselection	s	0	0	0	0	0	0
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Ncell 1	ms	-			3		
Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 4.2.18.5-2 : Cell 1 specific test parameters for HD-FDD intra frequency cell reselection test case for Cat-NB1 UE in normal coverage

Parameter	Unit	Cell 1		
		T1	T2	T3
$BW_{channel}$	MHz	10		
NOCNG Pattern defined in clause D.3	-	NOP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
Qrxlevmin	dBm	-140	-140	-140
Pcompensation	dB	0	0	0
$Qhyst_s$	dB	0	0	0
$Qoffset_{s,n}$	dB	0	0	0
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	3+TT	3+TT	3+TT
$\hat{E}_s/I_{ot}$ Note2	dB	3+TT	3+TT	3+TT
RSRP Note2	dBm/15 kHz	-85+TT	-85+TT	-85+TT
Treselection	s	0	0	0
Propagation Condition		AWGN		
Antenna Configuration		1x1		
Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}. Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

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

The cell re-selection delay to a newly detectable cell shall be less than 56.12 s.

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

The cell re-selection delay to an already detected cell shall be less than 11.62 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,NB\_Intra\_NB-IoT-NC} + T_{SI}$, and to an already detected cell can be expressed as: $T_{evaluate,\ NB\_intra\_NB-IoT-NC} + T_{SI-NB}$,

Where:

$T_{detect,NB\_Intra\_NB-IoT-NC}$ as specified in TS 36.133 [4] Table 4.6.2.2-1 in clause 4.6.2.2.

$T_{evaluate,\ NB\_intra\_NB-IoT-NC}$ as specified in TS 36.133 [4] Table 4.6.2.2-1 in clause 4.6.2.2.

T_{SI-NB} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 5120 ms is assumed in this test case.

This gives a total of 56.12s for the cell re-selection delay to a newly detectable cell and 11.62 s for the cell re-selection delay to an already detected cell in the test case.

4.3 E-UTRAN to UTRAN Cell Re-Selection

4.3.1 E-UTRAN FDD - UTRAN FDD cell re-selection

4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority

4.3.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of higher priority.

4.3.1.1.2 Test applicability

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

4.3.1.1.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier}$ is the number of carriers used in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

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

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

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD} + Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ when $Treselection_{RAT} = 0$ as specified in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.1.

4.3.1.1.4 Test description

4.3.1.1.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 4.3.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.1.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.1.4.1-1: General test parameters for E-UTRA FDD- higher priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during T2
T2 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell 1	
T3 end condition	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3
	Neighbour cell		Cell 2	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account
T3		s	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.

4.3.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Before T1 the UE is camped on to cell 1. During T1, cell 2 shall be powered off, and during the off time the scrambling code shall be changed. At the start of T2 cell 2 becomes stronger than $Thresh_{x\_high}$, the UE is expected to detect cell 2, send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure on cell 2. At the start of T3 cell 2 becomes weaker than $Thresh_{serving\_low}$, and the UE reselects to Cell 1.

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T1 in Table 4.3.1.1.5-1 and 4.3.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. During T1, Cell 2 shall be powered off and the SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100).

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.1.5-1 and 4.3.1.1.5-2. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

5. If the UE responds on Cell 2 within 81s from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 7. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 10.

7. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.1.5-1 and 4.3.1.1.5-2.

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

9. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 11. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 10.

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

11. Repeat step 2-10 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-1 Table H.2.3-2 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.1.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	5		
s-PrioritySearch1	31 (62dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	18 (36dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	2 (4 dB)		
threshXlow	25 (50 dB)		
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.1.5 Test requirement

Tables 4.3.1.1.4-1, 4.3.1.1.5-1 and 4.3.1.1.5-2 define the primary level settings including test tolerances for inter-RAT cell re-selection E-UTRA FDD to UTRA FDD test case (UTRA is of higher priority).

Table 4.3.1.1.5-1: Cell specific Test Parameters for Cell 1(E-UTRA FDD)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note 1]	dB			
OCNG_RB[Note 1]	dB			
Qqualmin for UTRA neighbour cell	dB	-20		
Qrxlevmin for UTRA neighbour cell	dBm	-115		
Qrxlevmin	dBm	-140		
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-82.95	-82.95	-82.95
$\hat{E}_s/I_{ot}$	dB	15.05	15.05	15.05
$\hat{E}_s/N_{oc}$	dB	15.05	15.05	15.05
$Treselection_{EUTRAN}$	s	0		
Snonintrasearch	dB	50		
$Thresh_{x, high}$ (Note 2)	dB	40		
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2 : This refers to the value of $Thresh_{x, high}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell				

Table 4.3.1.1.5-2: Cell specific test parameters for Cell 2 (higher priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
UTRA RF Channel Number		Channel 2		
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
OCNS_Ec/Ior	dB	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	-∞	11.90	-5.70
I_{oc}	dBm/3,84 MHz	-70.10		
CPICH_Ec/Io	dB	-∞	-10.27	-16.74
CPICH_RSCP	dBm	-∞	-68.20	-85.80
Propagation Condition		AWGN		
Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
QrxlevminEUTRA	dBm	-140		
UE_TXPWR_MAX_RACH	dBm	21		
Treselection	s	0		
Sprioritysearch1	dB	62		
Sprioritysearch2	dB	0		
$Thresh_{serving,\ low}$	dB	36		
$Thresh_{x,\ low}$ (Note 1)	dB	50		
Note 1: This refers to the value of $Thresh_{x,\ low}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.				

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateUTRA\_FDD} + T_{SI\text{-}UTRA}$

Where:

$T_{higher\_priority\_search}$ See section 4.2.2 of TS 36.133 [4]; 60s is assumed in this test case

$T_{evaluateUTRA\text{-}FDD}$ See Table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1

$T_{SI\text{-}UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s for higher priority cell search, allow 81 s for higher priority cell reselection in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority

4.3.1.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.1.2.2 Test applicability

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

4.3.1.2.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers used in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

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

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

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD}$ * $T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier}$ * $T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD.}$ If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier}$ * $T_{evaluateUTRA\_FDD}$ when $Treselection_{RAT}$ = 0 as specified in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.2.

4.3.1.2.4 Test description

4.3.1.2.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 4.3.1.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.2.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.2.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.1.2.4.2 Test procedure

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

In the following test procedure “UE responds” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table 4.3.1.2.5-1 and 4.3.1.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.2.5-1 and 4.3.1.2.5-2.
6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.1.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.2.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.2.5 Test requirement

Tables 4.3.1.2.4.1-1, 4.3.1.2.5-1 and 4.3.1.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD inter-RAT cell re-selection test case which UTRA is of lower priority.

Table 4.3.1.2.5-1: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		
Qqualmin for UTRA neighbour cell	dB	-20	
Qrxlevmin for UTRA neighbour cell	dBm	-115	
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.35	
RSRP	dBm/15 KHz	-84.95	-103.05
$\hat{E}_s/I_{ot}$	dB	14.40	-3.70
$\hat{E}_s/N_{oc}$	dB	14.40	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	42	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.			

Table 4.3.1.2.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 2	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.18	-10.18
CPICH_RSCP	dBm	-66.20	-66.20
Propagation Condition		AWGN	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
QrxlevminEUTRA	dBm	-140	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	s	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
$Thresh_{x,\ high}$ (Note 1)	dB	48	
Note 1: This refers to the value of $Thresh_{x,\ high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.			

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_FDD} + T_{SI-UTRA}$

Where:

$T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.3 E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority

4.3.1.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

4.3.1.3.2 Test applicability

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

4.3.1.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers used in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

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

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

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If, after it detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ when $Treselection_{RAT} = 0$ as specified in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.3.

4.3.1.3.4 Test description

4.3.1.3.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.26.
2. The general test parameter settings are set up according to Table 4.3.1.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.3.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.3.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case in fading conditions

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN Cell.
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test.
	Neighbour cell		Cell2	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		s	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
T3		s	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send preambles to cell 2
T4		s	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

4.3.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are four successive time periods, with time duration of T1, T2, T3 and T4 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2. Time duration T2 and T4 are not used for cell re-selection in the test.

In the following test procedure, “UE responds on Cell 1” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2” and “UE responds on Cell 2” means “UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

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

2. Set the parameters according to duration T0 in Table 4.3.1.3.5-1 and 4.3.1.3.5-2.

3. Set the parameters according to T2 in Table 4.3.1.3.5-3 and 4.3.1.3.5-4. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T2 starts.

4. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 2.

5. If the UE responds on Cell 2 within T2, then count a fail for the event “Hold out on Cell 1” and skip to step 10. Otherwise, count a success for the event “Hold out on Cell 1” and after T2 expires continue with step 6.

6. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.3.5-3 and 4.3.1.3.5-4.

7. The SS waits for random access request information from the UE to perform cell re-selection on Cell 2.

8. If the UE responds on Cell 2 during time duration T3 within 21 seconds from the beginning of time period T3, then count a success for the event “Re-select lower priority Cell 2”.
   Otherwise, count a fail for the event “Re-select lower priority Cell 2”.

9. If the UE responds on Cell 2 within T3, at the moment of the request-reception continue with step 10. Otherwise, after T3 expires skip to step 17.

10. The SS shall switch the power setting from T3 to T4 as specified in Table 4.3.1.3.5-3 and 4.3.1.3.5-4.

11. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on Cell 1 within T4, then count a fail for the event "Hold out on Cell 2" and skip to step 17. Otherwise, count a success for the event "Hold out on Cell 2" and after T4 expires continue with step 13.

13. The SS shall switch the power setting from T4 to T1 as specified in Table 4.3.1.3.5-3 and 4.3.1.3.5-4.

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

15. If the UE responds on Cell 1 within T1, at the moment of the request-reception skip to step 17. Otherwise, after T1 expires continue with step 16.

16. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1. Set the parameters according to duration T0 in Table 4.3.1.3.5-1 and 4.3.1.3.5-2.

17. Repeat step 3-16 until a test verdict has been achieved.
    Each of the events "Hold out on Cell 1", "Re-select lower priority Cell 2" and "Hold out on Cell 2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.3.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.1.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.1.3.4.3-2: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection in fading conditions

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	22 (44 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.3.5 Test requirement

Tables 4.3.1.3.4.1-1, 4.3.1.3.5-1, 4.3.1.3.5-2, 4.3.1.3.5-3 and 4.3.1.3.5-4 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD inter-RAT cell re-selection test case which UTRA is of lower priority. Note that the time period for T0 is system implementation dependent.

Table 4.3.1.3.5-1: Cell specific test parameters for Cell 1 (Lower priority E-UTRA FDD)

Parameter	Unit	Cell 1
		T0
E-UTRA RF Channel number		1
$BW_{channel}$	MHz	10
Antenna Configuration		1x2
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD
PSS_RA	dB	0
SSS_RA	dB	0
PCFICH_RB	dB	0
PHICH_RA	dB	0
PHICH_RB	dB	0
PDCCH_RA	dB	0
PDCCH_RB	dB	0
PDSCH_RA	dB	0
PDSCH_RB	dB	0
OCNG_RA[Note 1]	dB	0
OCNG_RB[Note 1]	dB	0
Qqualmin for UTRA neighbour cell	dB	-20
Qrxlevmin for UTRA neighbour cell	dBm	-115
Qrxlevmin	dBm	-140
N_{oc}	dBm/15 kHz	-104
RSRP	dBm/15 KHz	-82
$\hat{E}_s/I_{ot}$	dB	22
$\hat{E}_s/N_{oc}$	dB	22
$Treselection_{EUTRAN}$	s	0
Snonintrasearch	dB	Not sent
$Thresh_{serving, low}$	dB	44
$Thresh_{x, low}$ (Note 2)	dB	42
Propagation Condition		AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.		

Table 4.3.1.3.5-2: Cell specific test parameters for Cell 2 (Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)
		T0
UTRA RF Channel Number		Channel 2
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior	dB	-0.941
$\hat{I}_{or}/I_{oc}$	dB	13.80
I_{oc}	dBm/3,84 MHz	-70
CPICH_Ec/Io	dB	-10.18
CPICH_RSCP	dBm	-66.20
Propagation Condition		AWGN
Qqualmin	dB	-20
Qrxlevmin	dBm	-115
QrxlevminEUTRA	dBm	-140
UE_TXPWR_MAX_RACH	dBm	21
Treselection	s	0
Sprioritysearch1	dB	42
Sprioritysearch2	dB	0
$Thresh_{x, high}$ (Note 1)	dB	44
Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell		

Table 4.3.1.3.5-3: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1			
		T1	T2	T3	T4
E-UTRA RF Channel number		1			
$BW_{channel}$	MHz	10			
Correlation Matrix and Antenna Configuration		1x2 Low			
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			
PSS_RA	dB	0			
SSS_RA	dB	0			
PCFICH_RB	dB	0			
PHICH_RA	dB	0			
PHICH_RB	dB	0			
PDCCH_RA	dB	0			
PDCCH_RB	dB	0			
PDSCH_RA	dB	0			
PDSCH_RB	dB	0			
OCNG_RA[Note 1]	dB	0			
OCNG_RB[Note 1]	dB	0			
Qqualmin for UTRA neighbour cell	dB	-20			
Qrxlevmin for UTRA neighbour cell	dBm	-115			
Qrxlevmin	dBm	-140			
N_{oc}	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82	-82	-107	-107
$\hat{E}_s/I_{ot}$	dB	22	22	-3	-3
$\hat{E}_s/N_{oc}$	dB	22	22	-3	-3
$Treselection_{EUTRAN}$	s	0			
Snonintrasearch	dB	Not sent			
$Thresh_{serving, low}$	dB	44			
$Thresh_{x, low}$ (Note 2)	dB	42			
Propagation Condition		ETU70			

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

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system inform threshold for the UTRA target cell.

Table 4.3.1.3.5-4: Cell specific test parameters for Cell 2 (Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2	T3	T4
UTRA RF Channel Number		Channel 2			
CPICH_Ec/Ior	dB	-10			
PCCPCH_Ec/Ior	dB	-12			
SCH_Ec/Ior	dB	-12			
PICH_Ec/Ior	dB	-15			
OCNS_Ec/Ior	dB	-0.941			
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70			
CPICH_Ec/Io	dB	-10.18	-10.18	-10.18	-10.18
CPICH_RSCP	dBm	-66.20	-66.20	-66.20	-66.20
Propagation Condition		AWGN			
Qqualmin	dB	-20			
Qrxlevmin	dBm	-115			
QrxlevminEUTRA	dBm	-140			
UE_TXPWR_MAX_RACH	dBm	21			
Treselection	s	0			
Sprioritysearch1	dB	42			
Sprioritysearch2	dB	0			
$Thresh_{x, high}$ (Note 1)	dB	44			
Note 1: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell					

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be less than 10%.

The probability of re-selection from Cell 2 to Cell 1 during T4 observed during testing shall be less than 10%.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on Cell 2. In order to evaluate re-selection delay, the SS first needs to verify that the UE is camped on Cell 1 at the start of T3.

The cell re-selection delay to lower priority shall be less than 21 s.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_FDD} + T_{SI\text{-}UTRA}$

Where:

$T_{evaluateUTRA\text{-}FDD}$ See Table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1

$T_{SI\text{-}UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for lower priority cell reselection, allow 21 s.

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

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

4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth

4.3.1.4.1 Test purpose

Same test purpose as in clause 4.3.1.2.1.

4.3.1.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support only E-UTRA Band 31 and UTRA FDD.

4.3.1.4.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 4.3.1.2 with the following exceptions:

- Instead of A.4.3.1.2 → use A.4.3.1.4.

4.3.1.4.4 Test description

4.3.1.4.4.1 Initial conditions

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

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

Channel Bandwidth to be tested: 5MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 4.3.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.4.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.1.4.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case for 5MHz bandwidth

Same as Table 4.3.1.2.4.1-1.

4.3.1.4.4.2 Test procedure

Same test procedure as in clause 4.3.1.2.4.2 with the following exceptions:

- Instead of Table 4.3.1.2.5-1 → use Table 4.3.1.4.5-1.

4.3.1.4.4.3 Message contents

Same message contents as 4.3.1.2.4.3 with the following exceptions:

Table 4.3.1.4.4.3-1: System Information Block type 19: Inter-RAT E-UTRAN FDD - UTRA FDD is of lower priority cell re-selection for 5MHz bandwidth

Derivation Path: 36.508 [7] clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	25	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.1.4.5 Test requirement

Same test requirement as in clause 4.3.1.2.5 with the following exceptions:

Tables 4.3.1.4.4.1-1, 4.3.1.4.5-1 and 4.3.1.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD inter-RAT cell re-selection test case which UTRA is of lower priority.

Table 4.3.1.4.5-1: Cell specific test parameters for cell 1 (E-UTRA) for 5MHz bandwidth

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	5	
OCNG Patterns defined in D.1.16 (OP.16 FDD)		OP.16 FDD	
Note 1: See Table 4.3.1.2.5-1 for the other parameters.			

4.3.2 E-UTRAN FDD - UTRAN TDD cell re-selection

4.3.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRAN TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA cell is of lower priority.

4.3.2.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD.

4.3.2.3 Minimum conformance requirements

4.3.2.3.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.3.2 1.28Mcps TDD option

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in TS 36.133 [4] table 4.2.2.5.2-1.

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

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

The UE shall evaluate whether newly detectable UTRA TDD cells have met the reselection criteria in TS 36.304 within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is less than $S_{nonintrasearch}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD}$ *$T_{evaluateUTRA\_TDD}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6 dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.2.

4.3.2.3.3 7.68Mcps TDD option

There are no requirements so this is not tested.

4.3.2.4 Test description

4.3.2.4.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.4.2 1.28Mcps TDD option

4.3.2.4.2.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 4.3.2.4.2.1-1.

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

4. Message contents are as defined in clause 4.3.2.4.2.3.

5. There is one E-UTRA FDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.2.4.2.1-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRA FDD cell
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test.
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	E-UTRA FDD cell
CP length of cell 1			normal	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	

4.3.2.4.2.2 Test procedure

The test consists of one active cell and one neighbour cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the test. Cell 1 and Cell 2 belong to different tracking areas. The UTRA TDD layer is configured at a lower priority than the E-UTRA FDD layer.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS 36.304.

In the following test procedure “UE responds” means “UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure”.

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

2. Set the parameters according to T1 in Table 4.3.2.5.2-1 and 4.3.2.5.2-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1expires and skip to step 5.

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

4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.

5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.2.5.2-1 and 4.3.2.5.2-2.

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

7. If the UE responds on lower priority cell, Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.

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

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

4.3.2.4.2.3 Message contents

Message contents are according TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.2.4.2.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-7 Table H.2.3-8 Table H.2.3-14
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.2.4.2.3-2: System Information Block type 19: E-UTRA FDD- lower priority UTRA TDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	0 (0dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	23 (46 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.2.4.3 7.68 Mcps TDD option

There are no requirements so this is not tested.

4.3.2.5 Test requirement

4.3.2.5.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.5.2 1.28Mcps TDD option

Tables 4.3.2.4.2-1, 4.3.2.5.2-1 and 4.3.2.5.2-2 defines the primary level settings including test tolerances for E-UTRAN FDD to UTRA TDD cell re-selection test case.

Table 4.3.2.5.2-1: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
$Q_{rxlevmin}$	dBm/15kHz	-140	-140
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-86.9	-101.1
$\hat{E}_s/I_{ot}$	dB	11.1	-3.1
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	46 (-94dBm)	
$Thresh_{x, low}$ (Note2)	dB	24 (-79dBm)	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.			

Table 4.3.2.5.2-2: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	11	11	11	11
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.
Propagation Condition		AWGN			
$Q_{rxlevmin}$	dBm	-103			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
$Qhyst1_{s}$	dB	0			
$Thresh_{x,\ high}$ (Note2)	dB	46 (-94dBm)			
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of $Thresh_{x,\ high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.					

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_TDD} + T_{SI\text{-}UTRA}$

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, as specified in TS 36.133 [4] table 4.2.2.5.2-1

$T_{SI\text{-}UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case.

4.3.2.5.3 7.68 Mcps TDD option

There are no requirements so this is not tested.

4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection

4.3.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.3.2 Test applicability

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

4.3.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

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

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

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD} + Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 when $Treselection_{RAT} = 0$.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.3.

4.3.3.4 Test description

4.3.3.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 4.3.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.3.4.3.
5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.3.4.1-1: General test parameters for EUTRA TDD- lower priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			53	As specified in table 5.7.1-2 in TS 36.211
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than Cell 1.

In the following test procedure "UE responds" means "UE starts transmitting preamble on PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure".

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table 4.3.3.5-1 and 4.3.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.3.5-1 and 4.3.3.5-2.
6. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6 Table H.2.3-13
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.3.4.3-2: System Information Block type 19: EUTRA TDD- lower priority UTRA FDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	21 (42dB)		
s-PrioritySearch2	0	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	24 (48 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.3.5 Test requirement

Tables 4.3.3.4.1-1, 4.3.3.5-1 and 4.3.3.5-2 define the primary level settings including test tolerances for E-UTRAN TDD- UTRAN FDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.3.5-1: Cell specific test parameters for Cell 1(E-UTRA TDD)

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qqualmin for UTRA neighbour cell	dB	-20	
Qrxlevmin for UTRA neighbour cell	dBm	-115	
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.35	
RSRP	dBm/15 KHz	-84.95	-103.05
$\hat{E}_s/I_{ot}$	dB	14.40	-3.70
$\hat{E}_s/N_{oc}$	dB	14.40	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	42	
Propagation Condition		AWGN	

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

Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.

Table 4.3.3.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 2	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.18	-10.18
CPICH_RSCP	dBm	-66.20	-66.20
Propagation Condition		AWGN	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
QrxlevminEUTRA	dBm	-140	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
$Thresh_{x,\ high}$ (Note 1)	dB	48	
Note: This refers to the value of $Thresh_{x,\ high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.			

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

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

Cell re-selection delay to lower priority = $T_{evaluateUTRA\_FDD} + T_{SI\text{-}EUTRA}$

$T_{evaluateUTRA\_FDD}$ = 19.2 s; as specified in TS 36.133 [4] clause 4.2.2.5

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

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4 E-UTRAN TDD - UTRAN TDD cell re-selection

4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection: UTRA is of higher priority

4.3.4.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of higher priority.

4.3.4.1.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD.

4.3.4.1.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

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

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

The UE shall evaluate whether newly detectable UTRA TDD cells have met the re-selection criteria in TS 36.304 [6] within time $(N_{UTRA\_carrier\_TDD}) * T_{detectUTRA\_TDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every $(N_{UTRA\_carrier\_TDD}) * T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_TDD.}$ If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD} * T_{evaluateUTRA\_TDD}$ when $Treselection_{RAT} = 0$.as specified in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2 provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.1.

4.3.4.1.4 Test description

4.3.4.1.4.1 Initial conditions

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

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

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

1. Connect the SS (node B/eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.
2. The general test parameter settings are set up according to Table 4.3.4.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.4.1.4.3.
5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.1.4.1-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during the first T2 phase
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
T3 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T3
	Neighbour cell		Cell2	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
PRACH configuration of cell 1			53	As specified in table 5.7.1-3 in TS 36.211 [9]
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account.
T3		s	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.

4.3.4.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Before T1 the UE is camped on to cell 1. During T1, cell 2 shall be powered off, and during the off time the cell id shall be changed. At starting T2 cell 2 becomes stronger than $Thresh_{x\_high}$, the UE is expected to detect cell 2, send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 2. At the start of T3, cell 2 becomes weaker than $Thresh_{serving\_low}$, and the UE reselects to Cell 1.

In the following test procedure "UE responds" means "UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Routing Area Update procedure".

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

2. Set the parameters according to duration T1 in Table 4.3.4.1.5-1and 4.3.4.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. During T1, cell 2 shall be powered off and the SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.4.1.5-1 and 4.3.4.1.5-2. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

5. If the UE responds on Cell 2 within 81s from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, continue with step 7. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, skip to step 10.
7. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.4.1.5-1 and 4.3.4.1.5-2.
8. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.
9. If the UE has re-selected Cell 1 within T3, after the re-selection or when T3 expires, skip to step 11. Otherwise, if T3 expires and the UE has not yet re-selected Cell 1, continue with step 10.
10. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
11. Repeat step 2-10 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.4.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-3 Table H.2.3-4 Table H.2.3-14
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.4.1.4.3-2: System Information Block type 19: E-UTRA TDD- higher priority UTRA TDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	5		
s-PrioritySearch1	31 (62dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	12 (24dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	2 (4 dB)		
threshXlow	23 (46 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.4.1.5 Test requirement

Tables 4.3.4.1.4-1, 4.3.4.1.5-1 and 4.3.4.1.5-2 define the primary level settings including test tolerances for cell re-selection E-UTRA TDD to UTRA TDD test case (UTRA is of higher priority).

Table 4.3.4.1.5-1: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD		
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA^Note 1	dB			
OCNG_RB^Note 1	dB			
$Q_{rxlevmin}$	dBm	-140	-140	-140
N_{oc}	dBm/15kHz	-98		
RSRP	dBm/15kHz	-86.9	-86.9	-86.9
$\hat{E}_s/I_{ot}$	dB	11.1	11.1	11.1
$Thresh_{x, high}$ (Note2)	dB	24(-79dBm)		
$S_{nonintrasearch}$	dB	46		
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, high}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.				

Table 4.3.4.1.5-2: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number (Note1)		Channel 2					
PCCPCH_Ec/Ior	dB	-3	-3	-3			
DwPCH_Ec/Ior	dB				0	0	0
OCNS_Ec/Ior	dB	-3	-3	-3			
$\hat{I}_{or}/I_{oc}$	dB	-inf	11	-3	-inf	11	-3
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-inf	-72	-86	n.a.		
Propagation Condition		AWGN					
$Q_{rxlevmin}$	dBm	-103					
$Qoffset_{s,n}$	dB	C1, C2: 0					
$Qhyst_s$	dB	0					
$S_{nonintrasearch}$	dB	Not sent					
$Thresh_{serving,\ low}$	dB	24 (-79dBm)					
$Thresh_{x,\ low}$ (Note2)	dB	46 (-94dBm)					
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of Threshx, low which is included in UTRA system information, and is a threshold for the E-UTRA target cell.							

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateUTRA\_TDD} + T_{SI\_UTRA}$,

Where:

$T_{higher\_priority\_search}$ 60s, See TS 36.133 [4] section 4.2.2.5

$T_{evaluateUTRA\_TDD}$ 19.2s, See TS 36.133 [4] Table 4.2.2.5.2-1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that need to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s, allow 81 s for higher priority cell reselection in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4.2 E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority

4.3.4.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.4.2.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD.

4.3.4.2.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

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

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher, or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure such layers is not reduced and shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the re-selection criteria in TS 36.304 [6] within time $(N_{UTRA\_carrier\_TDD}) * T_{detectUTRA\_TDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every $(N_{UTRA\_carrier\_TDD}) * T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_TDD.}$ If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD} * T_{evaluateUTRA\_TDD}$ when $Treselection_{RAT} = 0$ as specified in table 4.2.2.5.2-1of TS36.133 [4] provided that the reselection criteria is met by a margin of at least 6dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.2.

4.3.4.2.4 Test description

4.3.4.2.4.1 Initial conditions

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

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

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

1. Connect the SS (node B/eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 4.3.4.2.4.1-1.

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

4. Message contents are as defined in clause 4.3.4.2.4.3.

5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.2.4.1-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD Cell
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test.
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
PRACH configuration of cell 1			53	As specified in table 5.7.1-3 in TS 36.211 [9]
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	85	
T2		s	25	

4.3.4.2.4.2 Test procedure

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

In the following test procedure “UE responds” means “UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Routing Area Update procedure”.

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

2. Set the parameters according to T1 in Table 4.3.4.2.5-1 and 4.3.4.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.

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

4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.

5. The SS shall switch the power setting from T1 to T2 as specified in Table 4.3.4.2.5-1 and 4.3.4.2.5-2.

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

7. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.

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

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.4.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-7 Table H.2.3-8 Table H.2.3-14
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.4.2.4.3-2: System Information Block type 19: E-UTRA FDD- lower priority UTRA TDD inter RAT cell re-selection test case

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	0 (0dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	23 (46 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.4.2.5 Test requirement

Tables 4.3.4.2.4.1-1, 4.3.4.2.5-1 and 4.3.4.2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD- UTRAN TDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.4.2.5-1: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA(Note1)	dB		
OCNG_RB(Note1)	dB		
$Q_{rxlevmin}$	dBm	-140	-140
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-86.9	-101.1
$\hat{E}_s/I_{ot}$	dB	11.1	-3.1
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	46 (-94dBm)	
$Thresh_{x, low (Note2)}$	dB	24 (-79dBm)	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA target cell			

Table 4.3.4.2.5-2: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	11	11	11	11
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.
Propagation Condition		AWGN			
$Q_{rxlevmin}$	dBm	-103			
$Qoffset_{s,n}$	dB	C1, C2: 0			
$Qhyst_s$	dB	0			
$Thresh_{x, high}$ (Note2)	dB	46 (-94dBm)			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information and is a threshold for the E-UTRA target cell.					

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2 and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message to perform a Routing Area Update procedure on Cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_TDD} + T_{SI\_UTRA}$,

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, See Table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case. For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority

4.3.4.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

4.3.4.3.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD.

4.3.4.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in table 4.3.4.3.3-1.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the reselection criteria in TS 36.304 [6] within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD}$ *$T_{evaluateUTRA\_TDD}$ when $T_{reselection}$ = 0 as specified in table 4.3.4.3.3-1 provided that the reselection criteria is met by a margin of at least 6dB.

Table 4.3.4.3.3-1: $T_{detectUTRA\_TDD}$, $T_{measureUTRA\_TDD}$ and $T_{evaluateUTRA\_TDD}$

DRX cycle length [s]	$T_{detectUTRA\_TDD}$ [s]	$T_{measureUTRA\_TDD}$ [s] (number of DRX cycles)	$T_{evaluateUTRA\_TDD}$ [s] (number of DRX cycles)
0.32	30	5.12 (16)	15.36 (48)
0.64		5.12 (8)	15.36 (24)
1.28		6.4(5)	19.2 (15)
2.56	60	7.68 (3)	23.04 (9)

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.3.

4.3.4.3.4 Test description

4.3.4.3.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.26.
2. The general test parameter settings are set up according to Table 4.3.4.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.4.3.4.3.
5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 7.2A.2 with the power level set according to Annex C.0 and C.1.

Table 4.3.4.3.4.1-1: General test parameters for EUTRA TDD- lower priority UTRA TDD inter RAT cell re-selection test case in fading conditions

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211 [9]
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		s	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
T3		s	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send PRACH preambles to cell 2
T4		s	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

4.3.4.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA TDD carrier. In the test there are four successive time periods, with time duration of T1, T2, T3 and T4 respectively. Both E-UTRA Cell 1 and UTRA Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2. Time duration T2 and T4 are not used for cell re-selection in the test.

In the following test procedure, "UE responds on Cell 1" means "UE starts transmitting preamble on PRACH for sending RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure according to TS 36.508 [7] clause 4.5A.2" and "UE responds on Cell 2" means "UE starts transmitting the SYNCH-UL sequence in the UpPTS for sending RRC CONNECTION REQUEST message to perform a Routing Area Update procedure".

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to duration T0 in Table 4.3.4.3.5-1 and 4.3.4.3.5-2.
3. Set the parameters according to T2 in Table 4.3.4.3.5-3 and 4.3.4.3.5-4. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T2 starts.
4. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 within T2, then count a fail for the event "Hold out on Cell 1" and skip to step 10. Otherwise, count a success for the event "Hold out on Cell 1" and after T2 expires continue with step 6.
6. The SS shall switch the power setting from T2 to T3 as specified in Table 4.3.4.3.5-3 and 4.3.4.3.5-4.
7. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

8. If the UE responds on Cell 2 during time duration T3 within 21 seconds from the beginning of time period T3, then count a success for the event "Re-select lower priority Cell 2".
   Otherwise, count a fail for the event "Re-select lower priority Cell 2".

9. If the UE responds on Cell 2 within T3, at the moment of the request-reception continue with step 10.
   Otherwise, after T3 expires skip to step 17.

10. The SS shall switch the power setting from T3 to T4 as specified in Table 4.3.4.3.5-3 and 4.3.4.3.5-4.

11. The SS monitors for possible random access request information from the UE to perform cell re-selection on Cell 1.

12. If the UE responds on Cell 1 within T4, then count a fail for the event "Hold out on Cell 2" and skip to step 17.
    Otherwise, count a success for the event "Hold out on Cell 2" and after T4 expires continue with step 13.

13. The SS shall switch the power setting from T4 to T1 as specified in Table 4.3.4.3.5-3 and 4.3.4.3.5-4.

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

15. If the UE responds on Cell 1 within T1, at the moment of the request-reception skip to step 17.
    Otherwise, after T1 expires continue with step 16.

16. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
    Set the parameters according to duration T0 in Table 4.3.4.3.5-1 and 4.3.4.3.5-2.

17. Repeat step 3-16 until a test verdict has been achieved.
    Each of the events "Hold out on Cell 1", "Re-select lower priority Cell 2" and "Hold out on Cell 2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. Different events may require different times for a verdict.
    If both events pass, the test passes. If one event fails, the test fails.

4.3.4.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and TS 34.108 [24] clause 6.1.0b with the following exceptions:

Table 4.3.4.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-8
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 4.3.4.3.4.3-2: System Information Block type 3 (1.28 Mcps TDD): Inter-RAT E-UTRA TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: 34.108 clause 6.1.0b			
Information Element	**Value/remark**	**Comment**	**Condition**
- SIB4 Indicator	TRUE		
- Cell identity	0000 0000 0000 0000 0000 0000 0001B		
- Cell selection and re-selection info			
- Mapping info	Not present		
- Cell selection and reselection quality measure	(no data)		
- CHOICE mode	TDD		
- Sintrasearch	10 dB		
- Sintersearch	10 dB		
- SsearchHCS	Not present		
- RAT List	Not present		
- Qrxlevmin	-103 dBm		
- Qhyst1s	0 dB		
- Treselections	0 seconds		

- HCS Serving cell information - Maximum allowed UL TX power	Not present 21dBm		

Table 4.3.4.3.4.3-3: System Information Block type 19: Inter-RAT E-UTRA TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: 36.508 clause 4.4.4.1 Table 4.4.4.1-1: System Information Block type 19			
Information Element	**Value/remark**	**Comment**	**Condition**
SysInfoType19 ::= SEQUENCE {			
utra-PriorityInfoList SEQUENCE {			
utra-ServingCell SEQUENCE {			
priority	3		
s-PrioritySearch1	0 (0dB)		
s-PrioritySearch2	Not present	default value is 0	
threshServingLow	0 (0dB)		
}			
eutra-FrequencyAndPriorityInfoList SEQUENCE (SIZE (1..maxNumEUTRAFreqs)) OF SEQUENCE		*n* denotes the index of the entry	
earfcn		Downlink EARFCN of Cell 1	
measurementBandwidth	50	Enumerated(6, 15, 25, 50, 75, 100)	
priority	4		
qRxLevMinEUTRA	-70 (-140 dBm)		
threshXhigh	22 (44 dB)		
threshXlow	1 (2 dB)	Default value	
eutra-blackListedCellList	Not present		
eutraDetection	TRUE		
}			
nonCriticalExtensions SEQUENCE {}	Not present		
}			

4.3.4.3.5 Test requirement

Tables 4.3.4.3.4.1-1, 4.3.4.3.5-1, 4.3.4.3.5-2, 4.3.4.3.5-3 and 4.3.4.3.5-4 define the primary level settings including test tolerances for E-UTRA TDD- UTRA TDD inter-RAT cell re-selection test case which UTRA is of lower priority.

Table 4.3.4.3.5-1: Cell specific test parameters for Cell 1 (E-UTRA TDD)

Parameter	Unit	Cell 1
		T0
E-UTRA RF Channel number		1
$BW_{channel}$	MHz	10
Antenna Configuration		1x2
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD
PSS_RA	dB	0
SSS_RA	dB	0
PCFICH_RB	dB	0
PHICH_RA	dB	0
PHICH_RB	dB	0
PDCCH_RA	dB	0
PDCCH_RB	dB	0
PDSCH_RA	dB	0
PDSCH_RB	dB	0
OCNG_RA[Note 1]	dB	0
OCNG_RB[Note 1]	dB	0
Qrxlevmin for UTRA neighbour cell	dBm	-103
Qrxlevmin	dBm	-140
N_{oc}	dBm/15 kHz	-104
RSRP	dBm/15 kHz	-82
$\hat{E}_s/I_{ot}$	dB	22
$\hat{E}_s/N_{oc}$	dB	22
$Treselection_{EUTRAN}$	s	0
Snonintrasearch	dB	Not sent
$Thresh_{serving, low}$	dB	44
$Thresh_{x, low}$ (Note 2)	dB	24
Propagation Condition		AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.		

Table 4.3.4.3.5-2: Cell specific test parameters for Cell 2 (UTRA TDD)

Parameter	Unit	Cell 2 (UTRA)
		T0
Timeslot Number		0
UTRA RF Channel Number (Note 1)		Channel 2
PCCPCH_Ec/Ior	dB	-3
DwPCH_Ec/Ior	dB	
OCNS_Ec/Ior	dB	-3
$\hat{I}_{or}/I_{oc}$	dB	13
I_{oc}	dBm/1.28 MHz	-80
PCCPCH RSCP	dBm	-70
Propagation Condition		AWGN
Qrxlevmin	dBm	-103
QrxlevminEUTRA	dBm	-140
UE_TXPWR_MAX_RACH	dBm	21
Treselection	s	0
$Thresh_{x, high}$ (Note 2)	dB	44
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell		

Table 4.3.4.3.5-3: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1			
		T1	T2	T3	T4
E-UTRA RF Channel number		1			
Correlation Matrix and Antenna Configuration		1x2 Low			
$BW_{channel}$	MHz	10			
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD			
PSS_RA	dB	0			
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				
Qrxlevmin for UTRA neighbour cell	dBm	-103			
Qrxlevmin	dBm	-140			
N_{oc}	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82	-82	-107	-107
$\hat{E}_s/I_{ot}$	dB	22	22	-3	-3
$\hat{E}_s/N_{oc}$	dB	22	22	-3	-3
$Treselection_{EUTRAN}$	s	0			
Snonintrasearch	dB	Not sent			
$Thresh_{serving, low}$	dB	44			
$Thresh_{x, low}$ (Note 2)	dB	24			
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.					

Table 4.3.4.3.5-4: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)							
Timeslot Number		0				DwPTS			
		T1	T2	T3	T4	T1	T2	T3	T4
UTRA RF Channel Number (Note1)		Channel 2							
PCCPCH_Ec/Ior	dB	-3							
DwPCH_Ec/Ior	dB					0			
OCNS_Ec/Ior	dB	-3							
$\hat{I}_{or}/I_{oc}$	dB	13	13	13	13	13	13	13	13
I_{oc}	dBm/1.28 MHz	-80							
PCCPCH RSCP	dBm	-70	-70	-70	-70	n.a.	n.a.	n.a.	n.a.
Propagation Condition		AWGN							
Qrxlevmin	dBm	-103							
$\text{Qrxlevmin}_{\text{EUTRA}}$	dBm	-140							
UE_TXPWR_MAX_RACH	dBm	21							
Treselection	s	0							
$\text{Thresh}_{\text{x, high}}$ (Note2)	dB	44							
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note2: This refers to the value of $\text{Thresh}_{\text{x, high}}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell									

The probability of reselection from cell 1 to cell 2 during T2 observed during testing shall be less than 10%

The probability of reselection from cell 2 to cell 1 during T4 observed during testing shall be less than 10%

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2. In order to evaluate reselection delay, the system simulator first needs to verify that the UE is camped on cell 1 at the start of T3

The cell re-selection delay to lower priority cell can be expressed as:

Cell re-selection delay to lower priority = $T_{\text{evaluateUTRA\_TDD}} + T_{\text{SI-UTRA}}$

$T_{\text{evaluateUTRA\_TDD}}$ 19.2s, as specified in TS 36.133 [4] Table 4.2.2.5.2-1

$T_{\text{SI-UTRA}}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

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

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

4.4 E-UTRAN to GSM Cell Re-Selection

4.4.1 E-UTRAN FDD - GSM cell re-selection

4.4.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring GSM cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.4.1.2 Test applicability

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

4.4.1.3 Minimum conformance requirements

The cell re-selection delay shall be less than 4 * $T_{measure, GSM}$ + T_{BCCH} in RRC_IDLE state.

When the measurement rules defined in TS 36.304 [6] indicates that E-UTRAN inter-frequencies or inter-RAT frequency cells are to be measured, the UE shall measure the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell, GSM BCCH carriers of lower priority than the serving cell shall be measured at least every $T_{measure,GSM}$ as defined in table 4.2.2.5.3-1 of TS 36.133 [4] clause 4.2.2.5.3.

When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority search, it is determined that re-selection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s.

However, the minimum measurement filtering requirements specified shall still be met by the UE before it makes any determination that it may stop measuring the cell.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in TS 36.304 [6], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell re-selection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

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

At inter-RAT cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For E-UTRAN to GSM cell re-selection the interruption time must not exceed T_{BCCH} + 50 ms. T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell as defined in TS 45.008 [15] clause 6.2.

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

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 32 GSM carriers

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

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.3 and A.4.4.1.

4.4.1.4 Test description

4.4.1.4.1 Initial conditions

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

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

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 4.4.1.4.1-1.

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

4. Message contents are as defined in clause 4.4.1.4.3.

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

Table 4.4.1.4.1-1: General Test Parameters for E-UTRAN FDD - GSM cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA FDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA RF Channel Number			1	1 E-UTRA FDD carrier frequency
GSM ARFCN			1	12 GSM BCCH carriers are used
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
CP length of cell 1			Normal	
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.
Propagation channel			AWGN	

4.4.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cells on one E-UTRA FDD carrier and twelve GSM cells. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Cell 1 (E-UTRA FDD cell) and Cell 2 (GSM cell) shall belong to different Location Areas. During initialization before the start of the test, the UE is camped on Cell 1. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of Cell 2 but the signal levels do not meet the re-selection criterion during T1. At the start of T2, the signal levels change such that Cell 2 meets the re-selection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA FDD layer.

In the following test procedure "UE responds" means "UE starts transmitting RR Channel Request message for location update procedure".

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

2. Set the parameters according to T1 in Table's 4.4.1.5-1 and 4.4.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.

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

4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.

5. The SS shall switch the power setting from T1 to T2 as specified in Table's 4.4.1.5-1 and 4.4.1.5-2.

6. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.

7. If the UE responds on Cell 2 during time duration T2 within 27.9 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.

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

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.4.1.4.3 Message contents

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

Table 4.4.1.4.3-1: Common Exception messages for E-UTRAN FDD - GSM cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-9 Table H.2.3-10
Default RRC messages and information elements contents exceptions	Table H.3.2-1

All GSM cell messages indicated shall use the same content as described in the default message content in TS 45.008 [15] clause 9 for Rel-4 and later releases, with the exceptions above and as specified in Tables 4.4.1.5-1 and 4.4.1.5-2.

4.4.1.5 Test requirement

Tables 4.4.1.4.1-1, 4.4.1.5-1 and 4.4.1.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM cell re-selection test case.

Table 4.4.1.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s/I_{ot}$	dB	10.5	-3.70
$\hat{E}_s/N_{oc}$	dB	10.5	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ Note 2	dB	24	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for GSM target cell.			

Table 4.4.1.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90.00	-75.00
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

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

Cell re-selection delay = 4 * $T_{measureGSM}$ + T_{BCCH}

$T_{measureGSM}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3

T_{BCCH} = 1.9 s; maximum time allowed to read the BCCH data from GSM cell, when being synchronized to a BCCH carrier; as specified in TS 45.008 [15] clause 6.2

The cell re-selection delay shall be less than a total of 27.9 seconds in this test case (note: this gives a total of 26 seconds for the $T_{measureGSM}$ calculation plus 1.9 s for T_{BCCH} but the test allows 27.9 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.4.2 E-UTRAN TDD - GSM cell re-selection

4.4.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring GSM cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.4.2.2 Test applicability

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

4.4.2.3 Minimum conformance requirements

If the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ then:

- The UE may not search for, or measure GSM cells if the priority of GSM is equal to, or lower than the serving cell.

- The UE shall search for and measure GSM cells if the priority of GSM is higher than the serving cell. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall measure, according to the measurement rules defined in TS 36.304 [6] at least every $T_{measure,GSM}$ as defined in table 4.2.2.5.3-1 of TS 36.133 [4] clause 4.2.2.5.3:

- If a detailed neighbour cell list is provided, the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell; or

- If only BCCH carriers are provided, the signal level of the GSM BCCH carriers indicated in the measurement control system information of the serving cell

If the RSRP of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for GSM BCCH carrier at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies. When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If re-selection to any higher priority cell is not triggered within (4 * $T_{measure\_GSM}$ + $Treselection_{RAT}$) after it has been found in a higher priority search, the UE is not required to continue make measurements of the BCCH carrier to evaluate the ongoing possibility of re-selection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in TS 36.304 [6], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell re-selection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.3 and A.4.4.2.

4.4.2.4 Test description

4.4.2.4.1 Initial conditions

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

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

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 4.4.2.4.1-1.

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

4. Message contents are as defined in clause 4.4.2.4.3.

5. There is one E-UTRA TDD cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.4.2.4.1-1: General test parameters for E-UTRA TDD GSM cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA TDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA RF Channel Number			1	1 E-UTRA TDD carrier frequency
GSM ARFCN			1	12 GSM BCCH carriers are used
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration for cell 1			6	As specified in table 4.2.1 in TS 36.211
PRACH configuration for cell 1			53	As specified in table 5.7.1-3 in TS 36.211
CP length of cell 1			Normal	
Access Barring Information			Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
Propagation channel			AWGN	
T1		s	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.

4.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier and twelve GSM cells. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Cell 1 (E-UTRA TDD cell) and Cell 2 (GSM cell) belong to different Location Areas. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of Cell 2 but the signal levels do not meet the re-selection criterion. At the start of T2, the signal levels change such that Cell 2 meets the re-selection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA TDD layer.

In the following test procedure “UE responds” means “UE starts transmitting RR Channel Request message for location update procedure”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to T1 in Table’s 4.4.2.5-1 and 4.4.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts. If the UE is already camped in Cell 1, wait until T1 expires and skip to step 5.
3. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 1.
4. If the UE has re-selected Cell 1 within T1, after the re-selection or when T1 expires, continue with step 5. Otherwise, if T1 expires and the UE has not yet re-selected Cell 1, skip to step 9.
5. The SS shall switch the power setting from T1 to T2 as specified in Table’s 4.4.2.5-1 and 4.4.2.5-2.
6. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.
7. If the UE responds on Cell 2 during time duration T2 within 27.9 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. If the UE has re-selected Cell 2 within T2, after the re-selection or when T2 expires, skip to step 10. Otherwise, if T2 expires and the UE has not yet re-selected Cell 2, continue with step 9.
9. Switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.4.2.4.3 Message contents

Message contents are according to TS 36.508 [4] clause 4.6 with the following exceptions:

Table 4.4.2.4.3-1: Common Exception messages for E-UTRAN TDD - GSM cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-9 Table H.2.3-10
Default RRC messages and information elements contents exceptions	Table H.3.2-2

All GSM cell messages indicated shall use the same content as described in the default message content in TS 45.008 [15] clause 9 for Rel-4 and later releases, with the exceptions above and as specified in Tables 4.4.2.5-1 and 4.4.2.5-2.

4.4.2.5 Test requirement

Tables 4.4.2.4.1-1, 4.4.2.5-1 and 4.4.2.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM cell re-selection test case.

Table 4.4.2.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$Q_{rxlevmin}$	dBm	-140	
N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s/I_{ot}$	dB	10.5	-3.70
$\hat{E}_s/N_{oc}$	dB	10.5	-3.70
$T_{reselectionEUTRAN}$	s	0	
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	24	

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

Note 2: This refers to $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for GSM target cell.

Table 4.4.2.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90.00	-75.00
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

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

Cell re-selection delay = 4 * TmeasureGSM + T_{BCCH}

TmeasureGSM = 6.4 s; as specified in TS 36.133 [4] Table 4.2.2.5.3-1 in clause 4.2.2.5.3

T_{BCCH} = 1.9 s; the maximum time allowed to read the BCCH data, when being synchronized to a BCCH carrier as specified in TS 45.008 [15] clause 6.2

This gives a total of 25.6 s + T_{BCCH}, allow 26 s + T_{BCCH} in the test case.

The cell re-selection delay shall be less than a total of 27.9 seconds in this test case (note: this gives a total of 26 seconds for the $T_{measureGSM}$ calculation plus 1.9 s for T_{BCCH} but the test allows 27.9 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.5 E-UTRAN to HRPD Cell Re-Selection

4.5.1 E-UTRAN FDD - HRPD Cell re-selection

4.5.1.1 E-UTRAN FDD - HRPD Cell Reselection: HRPD is of Lower Priority

4.5.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring HRPD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.5.1.1.2 Test applicability

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

4.5.1.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to HRPD cell, the UE shall acquire the timing of HRPD cells.

When the measurement rules indicate that HRPD cells are to be measured, the UE shall measure CDMA2000 HRPD Pilot Strength of HRPD cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter ‘Number of HRPD Neighbour Frequency’, which is transmitted on E-UTRAN BCCH, is the number of carriers used for all HRPD cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than ‘HRPD Start Measuring E-UTRAN Rx Power Strength Threshold’ and HRPD is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure CDMA2000 HRPD Pilot Strength of the HRPD cells at least every (Number of HRPD Neighbour Frequency)*$T_{measureHRPD}$. In case HRPD is of higher priority than the currently selected E-

UTRAN frequency layer the UE shall measure HRPD cells at least every (Number of HRPD Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the HRPD cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateHRPD}$.

Table 4.2.2.5.4-1 of TS 36.133 [4] clause 4.2.2.5.4 gives values of $T_{measureHRPD}$ and $T_{evaluateHRPD}$

4.5.1.1.4 Test description

4.5.1.1.4.1 Initial conditions

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

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

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

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22
2. The general test parameter settings are set up according to Table 4.5.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.5.1.1.4.3
5. There is one E-UTRA FDD cell and one HRPD cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table4.5.1.1.4.1-1: General Test Parameters for E-UTRAN FDD - lower priority HRPD Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA FDD RF Channel Number			1	Only one FDD carrier frequency is used.
E-UTRA FDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.5.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one HRPD cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN FDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure "UE responds" means "UE starts transmitting access probe preambles on the Access Channel".

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

2. Set the parameters according to T1 in Tables 4.5.1.1.5-1 and 4.5.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts
3. When T1 expires the SS shall switch the power setting from T1 to T2 as specified in Tables 4.5.1.1.5-1 and 4.5.1.1.5-2.
4. The SS waits for probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.5.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions:

Table 4.5.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-11 Table H.2.3-12
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.5.1.1.5 Test requirement

Tables 4.5.1.1.5-1 and 4.5.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD cell re-selection test (HRPD cell is of lower priority).

Table 4.5.1.1.5-1: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s/I_{ot}$	dB	10.5	-3.7
$\hat{E}_s/N_{oc}$	dB	10.5	-3.7
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51.1	36.9
$Thresh_{serving, low}$	dB	44	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 4.5.1.1.5-2: Cell Specific Test Parameters for HRPD (cell # 2)

Parameter	Unit	Cell 2	
		T1	**T2**
HRPD RF Channel Number		1	
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	0	0
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		-6	
Treselection	s	0	
hrpd-CellReselectionPriority	-	0	
$Thresh_{x, low}$		-14	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateHRPD} + T_{SI-HRPD}$

Where:

$T_{evaluatHRPD}$ 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.4-1

$T_{SI-HRPD}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.5.2 E-UTRAN TDD - HRPD Cell re-selection

4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority

4.5.2.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring HRPD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.5.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support HRPD.

4.5.2.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to HRPD cell, the UE shall acquire the timing of HRPD cells.

When the measurement rules indicate that HRPD cells are to be measured, the UE shall measure CDMA2000 HRPD Pilot Strength of HRPD cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter ‘Number of HRPD Neighbour Frequency’, which is transmitted on E-UTRAN BCCH, is the number of carriers used for all HRPD cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than ‘HRPD Start Measuring E-UTRAN Rx Power Strength Threshold’ and HRPD is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure CDMA2000 HRPD Pilot Strength of the HRPD cells at least every (Number of HRPD Neighbour Frequency)*$T_{measureHRPD}$. In case HRPD is of higher priority than the currently selected E-UTRAN frequency layer the UE shall measure HRPD cells at least every (Number of HRPD Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the HRPD cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateHRPD}$.

Table 4.2.2.5.4-1 of TS 36.133 [4] clause 4.2.2.5.4 gives values of $T_{measureHRPD}$ and $T_{evaluateHRPD}$

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.4 and A.4.5.2.1.

4.5.2.1.4 Test description

4.5.2.1.4.1 Initial conditions

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

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

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

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22
2. The general test parameter settings are set up according to Table 4.5.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.5.2.1.4.3
5. There is one E-UTRA TDD cell and one HRPD cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.5.2.1.4.1-1: General Test Parameters for E-UTRAN TDD - lower priority HRPD Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1			Normal	
DRX cycle length		s	1.28	
E-UTRA TDD RF Channel Number			1	Only one TDD carrier frequency is used.
E-UTRA TDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier frequency is used.
E-UTRA TDD PRACH configuration of cell 1			53	As specified in table 4.7.1-3 in TS 36.211
E_UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.5.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one HRPD cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN TDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
2. Set the parameters according to T1 in Tables 4.5.2.1.5-1 and 4.5.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts
3. When T1 expires the SS shall switch the power setting from T1 to T2 as specified in Tables 4.5.2.1.5-1 and 4.5.1.1.5-2.
4. The SS waits for probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.5.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions:

Table 4.5.2.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-11 Table H.2.3-12
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.5.2.1.5 Test requirement

Tables 4.5.2.1.5-1 and 4.5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - HRPD cell re-selection test (HRPD cell is of lower priority).

Table 4.5.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 kHz	-99.4	
RSRP	dBm/15 KHz	-88.9	-103.1
$\hat{E}_s/I_{ot}$	dB	10.5	-3.7
$\hat{E}_s/N_{oc}$	dB	10.5	-3.7
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51.1	36.9
$Thresh_{serving, low}$	dB	44	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 4.5.2.1.1-3: Cell Specific Test Parameters for HRPD (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
HRPD RF Channel Number		1	
Control $\frac{E_b}{N_t}$ (38.4 kbps)	dB	21	
Control $\frac{E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	0	0
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		-6	
Treselection	s	0	
hrpd-CellReselectionPriority	-	0	
$Thresh_{x, low}$		-14	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateHRPD} + T_{SI-HRPD}$

Where:

$T_{evaluatHRPD}$ 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.4-1

$T_{SI-HRPD}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.6 E-UTRAN to cdma2000 1xRTT Cell Re-Selection

4.6.1 E-UTRAN FDD - cdma2000 1xRTT Cell re-selection

4.6.1.1 E-UTRAN FDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The intra-frequency cell reselection criteria related to scaling of measurement rules parameters need to be specified when parameters are finalized

The intra-frequency cell reselection criteria related to exact scaling parameters for different mobility states are undefined

Measurement bandwidth (current assumption is 6RB) is undefined

The “out of service” criteria is undefined

The transmission scheme (1Tx or 2Tx) undefined

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined, including uncertainties above 3GHz

Test tolerances have not yet been applied to the wanted and interfering signal levels

4.6.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring cdma2000 1xRTT cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the cdma2000 1x is of lower priority.

4.6.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT.

4.6.1.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to cdma2000 1X cell, the UE shall acquire the timing of cdma2000 1X cells.

When the measurement rules indicate that cdma2000 1X cells are to be measured, the UE shall measure cdma2000 1x RTT Pilot Strength of cdma2000 1X cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of CDMA2000 1X Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all cdma2000 1X cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'CDMA2000 1X Start Measuring E-UTRAN Rx Power Strength Threshold' and cdma2000 1X is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure Pilot Ec/Io of the CDMA2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)*$T_{measureCDMA2000\ 1X}$. In case cdma2000 1X is of higher priority than the currently selected E-UTRAN frequency layer, the UE shall measure cdma2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateCDMA2000\ 1X}$.

Table 4.2.2.5.5-1 of TS 36.133 [4] clause 4.2.2.5.5 gives values of $T_{measureCDMA2000\ 1X}$ and $T_{evaluateCDMA2000\ 1X}$.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.5 and A.4.6.1.1.

4.6.1.1.4 Test description

4.6.1.1.4.1 Initial conditions

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

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

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

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22
2. The general test parameter settings are set up according to Table 4.6.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.6.1.1.4.3
5. There is one E-UTRA FDD cell and one CDMA2000 1xRTT cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.6.1.1.4.1-1: General Test Parameters for E-UTRAN FDD - lower priority cdma2000 1X Cell Re-selection

Parameter	Unit	Value	Comment

Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA FDD RF Channel Number			1	Only one FDD carrier frequency is used.
E-UTRA FDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.6.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one CDMA200 1xRTT cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN FDD cell 1 and CDMA2000 1xRTT cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
2. Set the parameters according to T1 in Tables 4.6.1.1.5-1 and 4.6.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 4.6.1.1.5-1 and 4.6.1.1.5-2.
4. The SS waits for access probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.6.1.1.4.3 Message contents

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

Table 4.6.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-15 Table H.2.3-16
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.6.1.1.5 Test requirements

Tables 4.6.1.1.5-1 and 4.6.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT cell re-selection test (cdma2000 1x cell is of lower priority).

Table 4.6.1.1.5-1: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-89+ TT	-100+ TT
$\hat{E}_s/I_{ot}$	dB	9+ TT	-2+ TT
$\hat{E}_s/N_{oc}$	dB	9	-2
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51	40
$Thresh_{serving, low}$	dB	43	
Propagation Condition		AWGN	

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

Table 4.6.1.1.5-2: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
cdma2000 1X RF Channel Number		1	
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	[-7]	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	[-16]	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	[-12]	
$\hat{I}_{or}/I_{oc}$	dB	[0] + TT	[0] + TT
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	[-10] + TT	[-10] + TT
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		[-20]	
Treselection	s	0	
oneXRTT-CellReselectionPriority	-	0	
$Thresh_{x, low}$		[-28]	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000\ 1X} + T_{SI\text{-}cdma2000\ 1X}$

Where:

$T_{evaluatcdma2000\ 1X}$ = 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.5-1

$T_{SI\text{-}cdma2000\ 1X}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.6.2 E-UTRAN TDD - cdma2000 1xRTT Cell re-selection

4.6.2.1 E-UTRAN TDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined, including uncertainties above 3GHz

Test tolerances have not yet been applied to the wanted and interfering signal levels

4.6.2.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring cdma2000 1xRTT cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the cdma2000 1x is of lower priority.

4.6.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support cdma2000 1xRTT.

4.6.2.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to cdma2000 1X cell, the UE shall acquire the timing of cdma2000 1X cells.

When the measurement rules indicate that cdma2000 1X cells are to be measured, the UE shall measure cdma2000 1x RTT Pilot Strength of cdma2000 1X cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of CDMA2000 1X Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all cdma2000 1X cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'CDMA2000 1X Start Measuring E-UTRAN Rx Power Strength Threshold' and cdma2000 1X is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure Pilot Ec/Io of the CDMA2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)*$T_{measureCDMA2000\ 1X}$. In case cdma2000 1X is of higher priority than the currently selected E-UTRAN frequency layer, the UE shall measure cdma2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateCDMA2000\ 1X}$.

Table 4.2.2.5.5-1 of TS 36.133 [4] clause 4.2.2.5.5 gives values of $T_{measureCDMA2000\ 1X}$ and $T_{evaluateCDMA2000\ 1X}$.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.5 and A.4.6.2.1.

4.6.2.1.4 Test description

4.6.2.1.4.1 Initial conditions

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

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

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

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22

2. The general test parameter settings are set up according to Table 4.6.2.1.4.1-1.

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

4. Message contents are as defined in clause 4.6.2.1.4.3.

5. There is one E-UTRA TDD cell and one CDMA2000 1xRTT cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.6.2.1.4.1-1: General Test Parameters for E-UTRAN TDD - lower priority cdma2000 1X Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA TDD RF Channel Number			1	Only one TDD carrier frequency is used.
E-UTRA TDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier frequency is used.
E-UTRA TDD PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211

Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
E_UTRA TDD Access Barring Information	-	Not Sent	No additional delays in random access procedure.
T1	s	30	
T2	s	30	

4.6.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one CDMA200 1xRTT cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN TDD cell 1 and CDMA2000 1xRTT cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

In the following test procedure “UE responds” means “UE starts transmitting access probe preambles on the Access Channel”.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
2. Set the parameters according to T1 in Tables 4.6.2.1.5-1 and 4.6.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 4.6.2.1.5-1 and 4.6.2.1.5-2.
4. The SS waits for access probe preambles on the Access Channel on cell 2 from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, switch off and on the UE and ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2 in Cell 1.
7. Repeat steps 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.6.2.1.4.3 Message contents

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

Table 4.6.2.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-15 Table H.2.3-16
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.6.2.1.5 Test requirements

Tables 4.6.2.1.5-1 and 4.6.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - cdma2000 1xRTT cell re-selection test (cdma2000 1x cell is of lower priority).

Table 4.6.2.1.5-1: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-89+TT	-102+TT
$\hat{E}_s/I_{ot}$	dB	9+TT	-4+TT
$\hat{E}_s/N_{oc}$	dB	9	-4
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51	38
$Thresh_{serving, low}$	dB	44	
Propagation Condition		AWGN	

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

Table 4.6.2.1.5-2: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
cdma2000 1X RF Channel Number		1	
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	[-7]	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	[-16]	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	[-12]	
$\hat{I}_{or}/I_{oc}$	dB	[0] + TT	[0] + TT
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	[-10] + TT	[-10] + TT
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		[-20]	
Treselection	s	0	
oneXRTT-CellReselectionPriority	-	0	
$Thresh_{x, low}$		[-28]	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000\ 1X} + T_{SI\text{-}cdma2000\ 1X}$

Where:

$T_{evaluatcdma2000\ 1X}$ = 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.5-1

$T_{SI\text{-}cdma2000\ 1X}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5 E-UTRAN RRC_CONNECTED State Mobility

When the UE is in RRC_CONNECTED state on a cell, network-controlled UE-assisted handovers are performed. The UE makes measurements of attributes of the serving and neighbour cells to enable the handover process. This process allows the UE to transfer a connection between the UE and current cell to target cell.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Due to the undefined UE behaviour regarding the sending of HARQ-ACK after receiving a RRC message triggering an handover (acc. 3GPP TS 36.331 [5] Subclause 5.3.5.4), the SS behaviour when waiting for the appropriate HARQ acknowledgement should be as follows:

- Reception of an HARQ-ACK will cause no HARQ delay exclusion (acc. subclause 3A.1).
- Reception of an HARQ-NACK will cause HARQ retransmission and HARQ delay exclusion (acc. subclause 3A.1).
- UE-DTX (as observed by SS) will cause HARQ retransmission, but no HARQ delay exclusion (acc. subclause 3A.1).

Uplink for E-UTRA cell(s) is configured according to Annex A.3.

5.1 E-UTRAN Handover

5.1.1 E-UTRAN FDD-FDD Handover intra frequency case

5.1.1.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.1.2 Test applicability

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

5.1.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.1

5.1.1.4 Test description

5.1.1.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 5.1.1.4.1-1.

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

4. Message contents are defined in clause 5.1.1.4.3.

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

Table 5.1.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.1.1.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

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

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.1.4.3 Message contents

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

Table 5.1.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-1 Table H.3.2-3

Table 5.1.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.1.4.3-3: MeasResults: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCellsCHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 5.1.1.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.1.5 Test requirement

Tables 5.1.1.4.1-1 and 5.1.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

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

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.2 E-UTRAN TDD-TDD Handover intra frequency case

5.1.2.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.2.2 Test applicability

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

5.1.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.2 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.2.

5.1.2.4 Test description

5.1.2.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 5.1.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.2.4.1-1: General Test Parameters for E-UTRAN TDD/TDD Intra Frequency Handover case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in Annex A.1.2
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in Annex A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		μs	3	Synchronous cells 3μs or 92*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.2.1.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.2.4.3 Message contents

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

Table 5.1.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-2 Table H.3.2-3

Table 5.1.2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.2.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.2.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			

5.1.2.5 Test requirement

Tables 5.1.2.4.1-1 and 5.1.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Intra Frequency Handover test.

Table 5.1.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD/TDD Intra Frequency Handover case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note]	dB						
OCNG_RB[Note]	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc}	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.3 E-UTRAN FDD-FDD Handover inter frequency case

5.1.3.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 5, 13, and 25.

5.1.3.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

> $D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

> T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

> T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.1 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.2.1.

5.1.3.4 Test description

5.1.3.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.3.4.1-1.

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

4. Message contents are defined in clause 5.1.3.4.3.

5. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		Ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in Table 5.1.3.5-2
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells		3	ms	Asynchronous cells 3ms or 92160*Ts
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1 in 3GPP TS 36.133 [4] started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.3.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.3.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

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

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.3.4.3 Message contents

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

Table 5.1.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-1 Table H.3.2-3 Table H.3.6-2

Table 5.1.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.3.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.3.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.3.5 Test requirement

Tables 5.1.3.4.1-1, 5.1.3.5-1, and 5.1.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover test case.

Table 5.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7.50	7.50
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7.50	7.50
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-90.5	-90.5
Propagation Condition		AWGN					

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

Table 5.1.3.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD inter frequency handover test case

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.4 E-UTRAN TDD-TDD Handover inter frequency case

5.1.4.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 5, 13, and 25.

5.1.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.4

5.1.4.4 Test description

5.1.4.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 5.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.4.4.3.
5. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.4.4.1-1: General Test Parameters for E-UTRAN TDD-TDD inter frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two TDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		Ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in Table 5.1.4.5-2
CP length			Normal	
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information		-	Not sent	No additional delays in random access procedure
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Gap pattern configuration Id			1	As specified in Table 8.1.2.1-1 in 3GPP TS 36.133 [4] started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

Table 5.1.4.4.1-2: Void

5.1.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.4.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.4.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.4.4.3 Message contents

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

Table 5.1.4.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-2 Table H.3.2-3 Table H.3.6-2

Table 5.1.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.4.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			
}			

5.1.4.5 Test requirement

Tables 5.1.4.4.1-1 and 5.1.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Inter Frequency Handover test.

Table 5.1.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD/TDD Inter Frequency Handover case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in TS 36.133 [4] D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA^Note	dB						
OCNG_RB^Note	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7.50	7.50
N_{oc}	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7.50	7.50
RSRP	dBm/15 KHz	-94	-94	-94	- Infinity	-90.5	-90.5
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

Table 5.1.4.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD inter frequency handover test case

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms

T_{search} = 0, since cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.5 E-UTRAN FDD-FDD inter frequency Handover: unknown target cell

5.1.5.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover: unknown target cell is commanded by meeting the handover to an unknown target cell delay requirements.

5.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 13, and 25.

5.1.5.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then Tsearch = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.1 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.5.

5.1.5.4 Test description

5.1.5.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 5.1.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.5.4.3.
5. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.5.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
T1		s	≤5	
T2		s	1	

5.1.5.4.2 Test procedure

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables 5.1.5.4.1-1 and 5.1.5.5-1. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and start to transmit the PRACH to Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.5.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.1.5.5-1. T2 starts.
5. The UE shall transmit RRCConnectionReconfigurationComplete message.
6. If the UE transmits the uplink PRACH channel to Cell 2 less than 130 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell..
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.5.4.3 Message contents

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

Table 5.1.5.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-1 Table H.3.2-3

Table 5.1.5.4.3-2: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.5.5 Test requirement

Tables 5.1.5.4.1-1 and 5.1.5.5-1define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test.

Table 5.1.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test case

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-91
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$ (note: the target cell is unknown)

$T_{interrupt}$ = T_{search} + T_{IU} + 20 ms

T_{search} = 80, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.6 E-UTRAN TDD-TDD inter frequency handover: unknown target cell

5.1.6.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when the target cell is unknown and an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 13, and 25.

5.1.6.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [5].

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$.

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.4 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.6

5.1.6.4 Test description

5.1.6.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.6.4.1-1.

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

4. Message contents are defined in clause 5.1.6.4.3.

5. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.6.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1, 2	Two TDD carriers
DRX			OFF	Non-DRX test
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Gap pattern configuration			-	No gap pattern configured
T1		s	≤5	
T2		s	1	

5.1.6.4.2 Test procedure

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables 5.1.6.4.1-1 and 5.1.6.5-1. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.1.6.5-1. T2 starts.
5. The UE shall transmit RRCConnectionReconfigurationComplete message.
6. If the UE transmits the uplink PRACH channel to Cell 2 less than 130 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.6.4.3 Message contents

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

Table 5.1.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency handover unknown target cell test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-2 Table H.3.2-3

Table 5.1.6.4.3-2: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			
}			

5.1.6.5 Test requirement

Tables 5.1.6.4.1-1 and 5.1.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown.

Table 5.1.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1(OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	5
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	5
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms (note: the target cell is unknown)

T_{search} = 80 ms, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.7 E-UTRAN FDD-TDD Handover inter frequency case

5.1.7.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an E-UTRAN FDD-TDD inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.7.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5, 25, and 30.

5.1.7.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [5].

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in section 11.2 in 3GPP TS36.331 [5] plus the interruption time stated in TS 36.133 [4] section 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Section 8.1.2.3.4 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.7

5.1.7.4 Test description

5.1.7.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.7.4.1-1.

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

4. Message contents are defined in clause 5.1.7.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and E-UTRA TDD Cell 2 on each carrier specified in the test. E-UTRA FDD Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.7.4.1-1: General Test Parameters for E-UTRAN FDD-TDD inter frequency handover test case

Parameter		Unit	Value	Comment
Cell 1 PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 1 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 2 PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 2 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Cell 1 E-UTRA RF channel number			1	One FDD carrier is used
Cell 2 E-UTRA RF channel number			2	One TDD carrier is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
DRX			DRX_L	As specified in 3GPP TS 36.133 [4] section A.3.3
CP length			Normal	
E-UTRA TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 2.
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 2
E-UTRA TDD PRACH configuration			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Time offset between cells			3 ms	Asynchronous cells
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.7.4.2 Test procedure

The test scenario comprises of one E-UTRA FDD cell and one E-UTRA TDD cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.7.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.7.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.7.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.7.4.3 Message contents

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

Table 5.1.7.4.3-1: Common Exception messages for E-UTRAN FDD-TDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-2 Table H.3.2-3 Table H.3.6-2

Table 5.1.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.7.4.3-3: *MeasResults*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.7.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-98		
}			
}			

5.1.7.5 Test requirement

Tables 5.1.7.4.1-1 and 5.1.7.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-TDD Inter Frequency Handover test.

Table 5.1.7.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (cell #1) in E-UTRAN FDD-TDD Inter Frequency Handover test case

Parameter	Unit	Cell 1		
		T1	**T2**	**T3**
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	4.00	4.00	4.00
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	4.00
RSRP Note 3	dBm/15 KHz	-94.00	-94.00	-94.00
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.				

Table 5.1.7.5-2: Cell specific test parameters for E-UTRAN TDD (cell #2) in E-UTRAN FDD-TDD Inter frequency handover test case

Parameter	Unit	Cell 2		
		T1	T2	T3
E-UTRA RF Channel number		2		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	-Infinity	7.50	7.50
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	-Infinity	7.50	7.50
RSRP Note 3	dBm/15 KHz	-Infinity	-90.50	-90.50
Propagation Condition	AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms

T_{search} = 0, since cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.8 E-UTRAN TDD-FDD Handover inter frequency case

5.1.8.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an E-UTRAN TDD-FDD inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.8.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5, 25, and 30.

5.1.8.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in section 11.2 in 3GPP TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] section 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Section 8.1.2.3.1 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.8.

5.1.8.4 Test description

5.1.8.4.1 Initial conditions

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

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

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

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.8.4.1-1.

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

4. Message contents are defined in clause 5.1.8.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.8.4.1-1: General Test Parameters for E-UTRAN TDD-FDD inter frequency handover test case

Parameter		Unit	Value	Comment
Cell 1 PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell 2 PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 2 PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
Cell 1 E-UTRA RF channel number			1	One TDD carrier is used
Cell 2 E-UTRA RF channel number			2	One FDD carrier is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in TS 36.133 [4] section A.3.3
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA FDD Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.8.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.8.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.8.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.8.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 5.1.8.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-1 Table H.3.2-3 Table H.3.6-2

Table 5.1.8.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.8.4.3-3: *MeasResults*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.8.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.8.4.3-5: *RACH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
preambleInitialReceivedTargetPower	dBm-90		
}			
}			

5.1.8.5 Test requirement

Tables 5.1.8.4.1-1, 5.1.8.5-1, and 5.1.8.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-FDD inter frequency handover test case.

Table 5.1.8.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD (cell #1) in TDD-FDD Inter frequency handover test case

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	4.00	4.00	4.00
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	4.00
RSRP Note 3	dBm/15 KHz	-94.00	-94.00	-94.00
Propagation Condition	AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.				

Table 5.1.8.5-2: Cell specific test parameters for E-UTRAN FDD (cell #2) in E-UTRAN TDD-FDD Inter frequency handover test case

Parameter	Unit	Cell 2		
		T1	T2	T3
E-UTRA RF Channel number		2		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	-Infinity	7.50	7.50
N_{oc} Note 2	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	-Infinity	7.50	7.50
RSRP Note 3	dBm/15 KHz	-Infinity	-90.50	-90.50
Propagation Condition	AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameter themselves.				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt}$ = T_{search} + T_{IU} + 20 ms

T_{search} = 0, since Cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth

5.1.9.1 Test purpose

Same test purpose as in clause 5.1.1.

5.1.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31.

5.1.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.1.1.3 with the following exceptions:

- Instead of A.5.1.1 → use A.5.1.9.

5.1.9.4 Test description

5.1.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 5.1.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.9.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 5.1.1.4.1-1 for other general test parameters. Note 2: This test is performed according to the principle defined in TS 36.133 [4] section A.3.7.2			

5.1.9.4.2 Test procedure

Same test procedure as in clause 5.1.1.4.2 with the following exceptions:

- Instead of Table 5.1.1.5-1 → use Table 5.1.9.5-1.

5.1.9.4.3 Message contents

Same message contents as in clause 5.1.1.4.3.

5.1.9.5 Test requirement

Same test requirement as in clause 5.1.1.5 with the following exceptions:

Tables 5.1.9.4.1-1 and 5.1.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case for 5MHz bandwidth.

Table 5.1.9.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover test case for 5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5			5		
OCNG Patterns defined in D.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 FDD	OP.16 FDD	OP.16 FDD	OP.15 FDD
Note: See Table 5.1.1.5-1 for other cell-specific test parameters.							

5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0

5.1.10.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE Category 0.

5.1.10.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

> $D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

> T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.10

5.1.10.4 Test description

5.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.10.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.10.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover for UE category 0 test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.10.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.10.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.10.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.10.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.10.4.3 Message contents

Same message content as in clause 5.1.1.4.3.

5.1.10.5 Test requirement

Tables 5.1.10.4.1-1 and 5.1.10.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover for UE category 0 test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt}$ = T_{search} + T_{IU} + 20 ms

T_{search} = 0, since Cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0

5.1.11.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.11.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE Category 0.

5.1.11.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay to be defined in clause 11.2 in TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] Clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.5 and A.5.1.11.

5.1.11.4 Test description

5.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.11.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.11.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.11.4.1-1: General Test Parameters for E-UTRAN HD-FDD intra frequency handover for UE category 0 test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.2.3
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.11.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.11.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.11.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table [H.3.2-3] implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.11.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.11.4.3 Message contents

Same message content as in clause 5.1.1.4.3.

5.1.11.5 Test requirement

Tables 5.1.11.4.1-1 and 5.1.11.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD-HD-FDD intra frequency handover test case.

Table 5.1.11.5-1: Cell Specific Test requirement Parameters for E-UTRAN HD-FDD intra frequency handover for UE category 0 test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86+TT
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0

5.1.12.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE Category 0.

5.1.12.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.2 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.12.

5.1.12.4 Test description

5.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 5.1.12.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.12.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.12.4.1-1: General Test Parameters for E-UTRAN TDD-TDD intra frequency handover for UE category 0 test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.12 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211 [9]
Time offset between cells		S	3 μs	Synchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

5.1.12.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.12.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.12.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.12.1.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.12.4.3 Message contents

Same message content as in clause 5.1.2.4.3.

5.1.12.5 Test requirement

Tables 5.1.12.4.1-1 and 5.1.12.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency handover test case.

Table 5.1.12.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD intra frequency handover for UE category 0 test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.13 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

5.1.13.1 Test purpose

To verify a category M1 UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.13.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1.

5.1.13.3 Minimum conformance requirements

The handover delay shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

> $D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.5.2.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

> T_{search} is the time required to search the target cell the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.2.1 for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.
>
> T_{MIB} is the time required for acquiring the MIB information of the target cell.
>
> T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.
>
> In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.2.1 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.1 and A.5.1.13.

5.1.13.4 Test description

5.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.13.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.13.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.13.4.1-1: General test parameters for E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in A.9
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.13.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.13.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.13.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.13.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 5.1.13.4.3-1: Common Exception messages for E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-3

Table 5.1.13.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.13.4.3-3:*MeasGapConfig-DP2*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.508, clause 4.6.6 Table 4.6.6-1B			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig-GP2 ::= CHOICE {			
setup SEQUENCE {			
gapOffset CHOICE {			
gp1	0	TGRP = 80 ms	Gap pattern ID = 1
}			
}			
}			

Table 5.1.13.4.3-4: *MeasResults*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.13.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.13.4.3-6: *PRACH-Config-v1310-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries		
RSRP-Range[1]	34	-107dBm	
RSRP-Range[2]	42	-99dBm	
RSRP-Range[3]	49	-92dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
PRACH-ParametersCE-r13[2] SEQUENCE {			
prach-ConfigIndex-r13[2]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf2		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n32		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
PRACH-ParametersCE-r13[3] SEQUENCE {			
prach-ConfigIndex-r13[3]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[3]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[3]	sf2		
maxNumPreambleAttemptCE-r13[3]	n5		
numRepetitionPerPreambleAttempt-r13[3]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[3]	r16		
prach-HoppingConfig-r13[3]	off		
}			
PRACH-ParametersCE-r13[4] SEQUENCE {			
prach-ConfigIndex-r13[4]	4	INTEGER (0..63)	FDD
prach-FreqOffset-r13[4]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[4]	sf2		
maxNumPreambleAttemptCE-r13[4]	n5		
numRepetitionPerPreambleAttempt-r13[4]	n128		

mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[4]	r64		
prach-HoppingConfig-r13[4]	off		
}			
}			
initial-CE-level-r13	0	INTEGER (0..3)	
}			

Table 5.1.13.4.3-7: *EPDCCH-Config-r11-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
EPDCCH-Config-r11 ::= SEQUENCE{			
config-r11{			
setup SEQUENCE {			
startSymbol-r11	2		
setConfigToReleaseList-r11	Not present		
setConfigToAddModList-r11 SEQUENCE {	1 entry		
setConfigId-r11[1]	0		
transmissionType-r11[1]	distributed		
resourceBlockAssignment-r11[1] SEQUENCE{			
numberPRB-Pairs-r11	n4		
resourceBlockAssignment-r11	1001		
}			
dmrs-ScramblingSequenceInt-r11[1]	0		
pucch-ResourceStartOffset-r11[1]	0		
re-MappingQCL-ConfigListId-r11[1]	0		
numberPRB-Pairs-v1310	Not present		
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		FDD
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			
}			
}			
}			
}			

Table 5.1.13.4.3-8: *SystemInformationBlockType1-BR-r13* : Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
freqHoppingParametersDL-r13 SEQUENCE {			
mpdcch-pdsch-HoppingNB-r13	nb2		
interval-DLHoppingConfigCommonModeA-r13 CHOICE {			
interval-FDD-r13	int4		FDD
}			
mpdcch-pdsch-HoppingOffset-r13	7	INTEGER (1..16 (maxAvailNarrowBands-r13))	
}			
}			

5.1.13.5 Test requirement

Tables 5.1.13.4.1-1 and 5.1.13.5-1 define the primary level settings including test tolerances.

Table 5.1.13.5-1: Cell specific test parameters for FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel defined in clause A.8.1		R.21 FDD			-		
MPDCCH Reference Channel defined in clause A.7.1		R.17 FDD			R.17 FDD		
PCFICH/PDCCH/PHICH Reference Channel defined in clause A.2.1		R.7 FDD			R.7 FDD		
OCNG Patterns defined in D.1.21		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s/I_{ot}$ Note 3	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	-56.22	-56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE finishes the transmission of all repetitions of the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{MIB} = 120 ms

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay shall be less than a total of 170 ms in this test case (note: derived from 15 ms for maximum RRC procedure delay plus 155 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.14 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

5.1.14.1 Test purpose

To verify a category M1 UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.14.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1.

5.1.14.3 Minimum conformance requirements

The handover delay shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.5.2.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.2.1 for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.2.1 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.2 and A.5.1.14.

5.1.14.4 Test description

5.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.14.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.14.4.3.
5. There is one E-UTRA HD-FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.14.4.1-1: General test parameters for E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one HD-FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in A.9
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.14.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.14.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.14.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.14.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.14.4.3 Message contents

Same message contents as in clause 5.1.13.4.3.

5.1.14.5 Test requirement

Tables 5.1.14.4.1-1 and 5.1.14.5-1 define the primary level settings including test tolerances.

Table 5.1.14.5-1: Cell specific test parameters for E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel defined in clause A.8.2		R.11 HD-FDD			-		
MPDCCH Reference Channel defined in clause A.7.2		R.7 HD-FDD			R.7 HD-FDD		
PCFICH/PDCCH/PHICH Reference Channel defined in clause A.2.3		R.4 HD-FDD			R.4 HD-FDD		
OCNG Patterns defined in D.1.21		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$ Note 3	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s/I_{ot}$	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	-56.22	-56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells		-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE finishes the transmission of all repetitions of the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{MIB} = 120 ms

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay shall be less than a total of 170 ms in this test case (note: derived from 15 ms for maximum RRC procedure delay plus 155 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.15 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA

5.1.15.1 Test purpose

To verify a category M1 UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.15.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1.

5.1.15.3 Minimum conformance requirements

The handover delay shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall finish the transmission of all repetitions of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.5.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20\text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.2.1 for a UE configured with CEModeA. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.2.1 for CEModeA.

The normative reference for this requirement is TS 36.133 [4] clause 5.5.2.3 and A.5.1.15.

5.1.15.4 Test description

5.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connector as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.15.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.15.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.15.4.1-1: General test parameters for E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			PRACH_4CE	As specified in A.9
PRACH initial CE level			0	Specified in the handover message
T1		s	5	
T2		s	≤5	
T3		s	1	
Gap pattern ID			1	

5.1.15.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.15.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.15.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.15.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE finishes the transmission of all repetitions of the PRACH to Cell 2 less than 170 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.15.4.3 Message contents

Same message contents as in clause 5.1.13.4.3 with following exceptions:

- Instead of Table 5.1.13.4.3-6 → use Table 5.1.15.4.3-1.
- Instead of Table 5.1.13.4.3-7 → use Table 5.1.15.4.3-2.
- Instead of Table 5.1.13.4.3-8 → use Table 5.1.15.4.3-3.

Table 5.1.15.4.3-1: *PRACH-Config-v1310-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries		
RSRP-Range[1]	34	-107dBm	
RSRP-Range[2]	42	-99dBm	
RSRP-Range[3]	49	-92dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n5		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[1]	r1		
prach-HoppingConfig-r13[1]	off		
}			
PRACH-ParametersCE-r13[2] SEQUENCE {			
prach-ConfigIndex-r13[2]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf2		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n32		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[2]	r4		
prach-HoppingConfig-r13[2]	off		
}			
PRACH-ParametersCE-r13[3] SEQUENCE {			
prach-ConfigIndex-r13[3]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[3]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[3]	sf2		
maxNumPreambleAttemptCE-r13[3]	n5		
numRepetitionPerPreambleAttempt-r13[3]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[3]	r4		
prach-HoppingConfig-r13[3]	off		
}			
PRACH-ParametersCE-r13[4] SEQUENCE {			
prach-ConfigIndex-r13[4]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[4]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[4]	sf2		
maxNumPreambleAttemptCE-r13[4]	n5		
numRepetitionPerPreambleAttempt-r13[4]	n128		

mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	1		
}			
mpdcch-NumRepetition-RA-r13[4]	r64		
prach-HoppingConfig-r13[4]	off		
}			
}			
initial-CE-level-r13	0	INTEGER (0..3)	
}			

Table 5.1.15.4.3-2: *EPDCCH-Config-r11-DEFAULT*: Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
EPDCCH-Config-r11 ::= SEQUENCE{			
config-r11{			
setup SEQUENCE {			
startSymbol-r11	2		
setConfigToReleaseList-r11	Not present		
setConfigToAddModList-r11 SEQUENCE {	1 entry		
setConfigId-r11[1]	0		
transmissionType-r11[1]	distributed		
resourceBlockAssignment-r11[1] SEQUENCE{			
numberPRB-Pairs-r11	n4		
resourceBlockAssignment-r11	1001		
}			
dmrs-ScramblingSequenceInt-r11[1]	0		
pucch-ResourceStartOffset-r11[1]	0		
re-MappingQCL-ConfigListId-r11[1]	0		
numberPRB-Pairs-v1310	Not present		
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
tdd-r13	v1		TDD
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			
}			
}			
}			
}			

Table 5.1.15.4.3-3: *SystemInformationBlockType1-BR-r13* : Additional E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
freqHoppingParametersDL-r13 SEQUENCE {			
mpdcch-pdsch-HoppingNB-r13	nb2		
interval-DLHoppingConfigCommonModeA-r13 CHOICE {			
interval-TDD-r13	Int10		TDD
}			
mpdcch-pdsch-HoppingOffset-r13	7	INTEGER (1..16 (maxAvailNarrowBands-r13))	
}			
}			

5.1.15.5 Test requirement

Tables 5.1.15.4.1-1 and 5.1.15.5-1 define the primary level settings including test tolerances.

Table 5.1.15.5-1: Cell specific test parameters for E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel defined in clause A.8.3		R.17 TDD			-		
MPDCCH Reference Channel defined in clause A.7.3		R.15 TDD			R.15 TDD		
PCFICH/PDCCH/PHICH Reference Channel defined in clause A.2.2		R.7 TDD			R.7 TDD		
OCNG Patterns defined in D.2.11		OP.11 TDD			OP.11 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	12.5	12.5
$\hat{E}_s/I_{ot}$ Note 3	dB	8	-4.74	-4.74	-Infinity	3.86	3.86
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-85.5	-85.5
Io Note 3	dBm/9MHz	-61.58	-56.22	-56.22	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Synchronous cells	μs	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE finishes the transmission of all repetitions of the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{MIB} + T_{IU}$ + 20 ms

T_{search} = 0, since Cell 2 is known prior to the test

T_{MIB} = 120 ms

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay shall be less than a total of 170 ms in this test case (note: derived from 15 ms for maximum RRC procedure delay plus 155 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.16 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex F needs to be updated

- The test tolerances and uncertainties applicable to this test are undefined

5.1.16.1 Test purpose

To verify the UE category M1's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements specified in TS 36.133 [4] clause 5.6.2.1.

5.1.16.2 Test applicability

This test applies to all types of E-UTRA FDD-FDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

5.1.16.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

where:

$D_{handover}$ equals the maximum RRC procedure delay defined in clause 11.2 of TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.6.2.1.2. The handover delay shall be less than $D_{handover}$.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrup}$

$$T_{interrup} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. If the target cell is known, then T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification per TS 36.133 [4] clause 5.6.2.1.2. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

The normative reference for this requirement is TS 36.133 [4] clause 5.6.2.1 and A.5.1.16.

5.1.16.4 Test description

5.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.16.4.1-1.
3. Propagation conditions are set according to Annex B clause B.1.
4. Message contents are defined in clause 5.1.16.4.3.
5. There is one E-UTRA FDD-FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.16.4.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover for Cat-M1 UEs in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in TS 36.133 [4] A.3.16
T1		s	5	
T2		s	≤5	
T3		s	5	
Gap pattern ID			1	

5.1.16.4.2 Test procedure

The test consists of one E_UTRA FDD-FDD carrier and two cells. The two cells, one active cell and one neighbour cell , are given in Tables 5.1.16.4.1-1 and 5.1.16.5-1. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3 as specified in TS 36.331 [5] clause 5.5.4.4. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because eMTC narrowband (6 PRBs) does not overlap with the centre 6 PRBs of the carrier bandwidth per TS 36.133 [4] clause A.5.1.16.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.16.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.16.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.16.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 2595 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, UE handover is back to Cell 1 or switch off the UE if the handover fails. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.16.4.3 Message contents

Message contents are according to clause 5.1.1.4.3.

5.1.16.5 Test requirement

Tables 5.1.16.4.1-1 and 5.1.16.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.16.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case for category M1 in CEmodeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel in TS 36.133 [4] A.3.1.4.4		R.23 FDD					
MPDCCH Reference Channel in TS 36.133 [4] A.3.1.3.4		R.19 FDD			R.19 FDD		
PCFICH/PDCCH/PHICH Reference Channel in clause TS 36.133 [4] A.3.1.2.1		R.7 FDD			R.7 FDD		
OCNG Patterns defined in TS 36.133 [4] A.3.2.3		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	-12+TT	-12+TT	-12+TT	-Infinity	-7+TT	-7+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	-12+TT	-12.79+TT	-12.79+TT	-Infinity	-7.27+TT	-7.27+TT
RSRP Note 3	dBm/15 KHz	-110+TT	-110+TT	-110+TT	-Infinity	-105+TT	-105+TT
Io Note 3	dBm/9MHz	-69.95+TT	-69.21+TT	-69.21+TT	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case can be expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

As specified in Section 5.1.16.3, $T_{interrupt} = T_{search} + T_{MIB} + T_{IU}$ + 20 ms, where

T_{search} = 0, since Cell 2 is known prior to the test,

T_{IU} = 15 ms, with 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion, and

T_{MIB} = 2545 ms, the time required for acquiring the MIB information of the target cell.

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

Therefore, the handover delay $D_{handover}$ shall be less than a total of 2595 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 2580 ms for $T_{interrupt}$). In other words, the UE shall start to transmit the PRACH to Cell 2 less than 2595 ms from the beginning of time period T3.

For the test to pass, the total number of successful tests observed during repeated tests shall be more than 90% of the case with a confidence level of 95%.

5.1.17 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex F needs to be updated

- The test tolerances and uncertainties applicable to this test are undefined.

5.1.17.1 Test purpose

To verify the UE category M1's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements specified in TS 36.133 [4] clause 5.6.2.1.

5.1.17.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

5.1.17.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

where

$D_{handover}$ equals the maximum RRC procedure delay defined in clause 11.2 of TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.6.2.1.2. The handover delay shall be less than $D_{handover}$.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrup}$

$$T_{interrup} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. If the target cell is known, then T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the uncertainty in acquiring the first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification per TS 36.133 [4] clause 5.6.2.1.2. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

The normative reference for this requirement is TS 36.133 [4] clause 5.6.2.2 and A.5.1.17.

5.1.17.4 Test description

5.1.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.17.4.1-1.
3. Propagation conditions are set according to Annex B clause B.1.
4. Message contents are defined in clause 5.1.17.4.3.
5. There is one E-UTRA HD-FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.17.4.1-1: General test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			PRACH_4CE	As specified in clause TS 36.133 [4] A.3.16
T1		s	5	
T2		s	≤5	
T3		s	5	
Gap pattern ID			2	

5.1.17.4.2 Test procedure

The test consists of one E_UTRA HD-FDD carrier and two cells. The two cells, one active cell and one neighbour cell , are given in Tables 5.1.17.4.1-1 and 5.1.17.5-1. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3 as specified in TS 36.331 [5] clause 5.5.4.4. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because eMTC narrowband (6 PRBs) does not overlap with the centre 6 PRBs of the carrier bandwidth per TS 36.133 [4] clause A.5.1.17.1.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.17.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.17.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.17.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 2595 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, UE handover is back to Cell 1 or switch off the UE if the handover fails. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.17.4.3 Message contents

Same message content as in clause 5.1.16.4.3.

5.1.17.5 Test requirement

Tables 5.1.17.4.1-1 and 5.1.17.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD-HD-FDD intra frequency handover test case.

Table 5.1.17.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra frequency handover for Cat-M1 UEs in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Measurement Channel in clause TS 36.133 [4] A.3.1.4.5		R.13 HD-FDD			-		
MPDCCH Reference Channel in clause TS 36.133 [4] A.3.1.3.5		R.9 HD-FDD			R.9 HD-FDD		
PCFICH/PDCCH/PHICH Reference Channel in clause TS 36.133 [4] A.3.1.2.3		R.4 HD-FDD			R.4 HD-FDD		
OCNG Patterns defined in TS 36.133 [4] A.3.2.3		OP.21 FDD			OP.21 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$ Note 3	dB	-12+TT	-12+TT	-12+TT	-Infinity	-7+TT	-7+TT
$\hat{E}_s/I_{ot}$	dB	-12+TT	-12.79+TT	-12.79+TT	-Infinity	-7.27+TT	-7.27+TT
RSRP Note 3	dBm/15 KHz	-110+TT	-110+TT	-110+TT	-Infinity	-105+TT	-105+TT
Io Note 3	dBm/9MHz	-69.95+TT	-69.21+TT	-69.21+TT	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Asynchronous cells	ms	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case can be expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

As specified in Section 5.1.17.3, $T_{interrupt} = T_{search} + T_{MIB} + T_{IU}$ + 20 ms, where

T_{search} = 0, since Cell 2 is known prior to the test,

T_{IU} = 15 ms, with 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion, and

T_{MIB} = 2545 ms, the time required for acquiring the MIB information of the target cell.

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

Therefore, the handover delay $D_{handover}$ shall be less than a total of 2595 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 2580 ms for $T_{interrupt}$). In other words, the UE shall start to transmit the PRACH to Cell 2 less than 2595 ms from the beginning of time period T3.

For the test to pass, the total number of successful tests observed during repeated tests shall be more than 90% of the case with a confidence level of 95%.

5.1.18 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex F needs to be updated

- The test tolerances and uncertainties applicable to this test are undefined

5.1.18.1 Test purpose

To verify the UE category M1's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements specified in TS 36.133 [4] clause 5.6.2.3.

5.1.18.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

5.1.18.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in TS 36.331 [5].

When the UE receives a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command,

where:

$D_{handover}$ equals the maximum RRC procedure delay defined in clause 11.2 of TS 36.331 [5] plus the interruption time stated in TS 36.133 [4] clause 5.6.2.3.2. The handover delay shall be less than $D_{handover}$.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the moment the UE has transmitted all repetitions of PRACH in the target cell, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrup}$

$$T_{interrup} = T_{search} + T_{MIB} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. If the target cell is known, then T_{search} shall be according to the non-DRX cell identification requirements specified in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

T_{MIB} is the time required for acquiring the MIB information of the target cell.

T_{IU} is the time required to complete the transmission of PRACH in the target cell. The actual value of T_{IU} shall depend upon the availability of first available PRACH occasion based on the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access preamble to the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal or longer than the time duration required for the cell identification per TS 36.133 [4] clause 5.6.2.3.2. Otherwise, it is unknown. The time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in TS 36.133 [4] clause 8.13.3.1 for a UE configured with CEModeB.

The normative reference for this requirement is TS 36.133 [4] clause 5.6.2.3 and A.5.1.18.

5.1.18.4 Test description

5.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources (without using the faders) to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 5.1.18.4.1-1.
3. Propagation conditions are set according to Annex B clause B.1.
4. Message contents are defined in clause 5.1.18.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.18.4.1-1: General test parameters for E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211 [9]
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211 [9]
PRACH configuration			PRACH_4CE	As specified in clause TS 36.133 [4] A.3.16
T1		s	5	
T2		s	≤5	
T3		s	5	
Gap pattern ID			1	

5.1.18.4.2 Test procedure

The test consists of one E_UTRA TDD carrier and two cells. The two cells, one active cell and one neighbour cell , are given in Tables 5.1.18.4.1-1 and 5.1.18.5-1. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. E-UTRAN shall send a RRC message implying handover to Cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3 as specified in TS 36.331 [5] clause 5.5.4.4. T3 is defined as the end of the last TTI containing the RRC message implying handover.

During the test, UE is configured with measurement gap for cell search, because eMTC narrowband (6 PRBs) does not overlap with the centre 6 PRBs of the carrier bandwidth per TS 36.133 [4] clause A.5.1.18.1.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.18.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.18.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message defined in Table H.3.2-3 implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.18.5-1.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. If the UE transmits the uplink PRACH channel to Cell 2 less than 2595 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. After T3 expires, UE handover is back to Cell 1 or switch off the UE if the handover fails. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.18.4.3 Message contents

Message contents are according to clause 5.1.2.4.3.

5.1.18.5 Test requirement

Tables 5.1.18.4.1-1 and 5.1.18.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency handover test case.

Table 5.1.18.5-1: Cell specific test parameters for E-UTRAN TDD Intra frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH Reference Measurement Channel in clause TS 36.133 [4] A.3.1.4.6		R.19 TDD			-		
MPDCCH Reference Channel in clause TS 36.133 [4] A.3.1.3.6		R.17 TDD			R.17 TDD		
PCFICH/PDCCH/PHICH Reference Channel in clause TS 36.133 [4] A.3.1.2.2		R.7 TDD			R.7 TDD		
OCNG Patterns defined in TS 36.133 [4] A.3.2.4		OP.11 TDD			OP.11 TDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	-12+TT	-12+TT	-12+TT	-Infinity	-7+TT	-7+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	-12+TT	-12.79+TT	-12.79+TT	-Infinity	-7.27+TT	-7.27+TT
RSRP Note 3	dBm/15 KHz	-110+TT	-110+TT	-110+TT	-Infinity	-105+TT	-105+TT
Io Note 3	dBm/9MHz	-69.95+TT	-69.21+TT	-69.21+TT	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1 Synchronous cells	µs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case can be expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

As specified in Section 5.1.18.3, $T_{interrupt} = T_{search} + T_{MIB} + T_{IU} + 20$ ms, where

$T_{search} = 0$, since Cell 2 is known prior to the test

$T_{IU} = 15$ ms, with 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

$T_{MIB} = 2545$ ms, the time required for acquiring the MIB information of the target cell.

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

Therefore, the handover delay $D_{handover}$ shall be less than a total of 2595 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 2580 ms for $T_{interrupt}$). In other words, the UE shall start to transmit the PRACH to Cell 2 less than 2595 ms from the beginning of time period T3.

For the test to pass, the total number of successful tests observed during repeated tests shall be more than 90% of the case with a confidence level of 95%.

5.2 Handover from E-UTRAN to other RATs

5.2.1 E-UTRAN FDD - UTRAN FDD handover

5.2.1.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 8, and 22.

5.2.1.3 Minimum conformance requirements

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$.

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$.

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. Performance requirements for E-UTRA to UTRA soft handover are not specified. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

T_{MC} is 0 ms if a single UTRA cell is configured as the handover target, otherwise 20 ms if handover to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the UTRA primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one in-sync is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.1.

5.2.1.4 Test description

5.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.1.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.1.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	Absolute UTRAN CPICH Ec/Iothreshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		s	5	
T2		s	≤5	
T3		s	1	

5.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.1.5-1 and 5.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.1.5-1 and 5.2.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.1.5-1 and 5.2.1.5-2.
9. If the UE transmits the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.1.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18 dB)	-18 dB is actual UTRA-Thres is actual Ec/Io value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	This is the typical value range used in UTRAN FDD tests.	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.1.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		

5.2.1.5 Test requirement

Tables 5.2.1.4.1-1, 5.2.1.5-1 and 5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover test.

Table 5.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD to UTRAN FDD handover test case (Cell 1)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA^{Note}	dB			
OCNG_RB^{Note}	dB			

$\hat{E}_s/I_{ot}$	dB	-1.10	-1.10	-1.10
$\hat{E}_s/N_{oc}$		-1.10	-1.10	-1.10
N_{oc}	dBm/15 kHz	-98		
RSRP Note 2	dBm/15 KHz	-99.10	-99.10	-99.10
Io Note 2	dBm/9 MHz	–67.72	-67.72	-67.72
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.2.1.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD cell

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
DCH_Ec/Ior	dB	N/A	N/A	Note 1
OCNS_Ec/Ior	dB	-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8	-1.8
I_{oc}	dBm/3,84 MHz	-70	-70	-70
CPICH_Ec/Io	dB	-infinity	-14	-14
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$ (note: the target cell is known)

$T_{interrupt1}$= T_{IU} + T_{sync}+ 50 + 10*F_{max} + T_{MC} ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

T_{MC} = 0 ms if a single UTRA cell is configured as the handover target. Otherwise T_{MC} = 20 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 190 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 140 ms for $T_{interrupt1}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.2 E-UTRAN TDD - UTRAN FDD handover

5.2.2.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 8, and 22.

5.2.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

> $D_{handover}$ equals the RRC procedure delay, which is 50ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$. The $T_{interrupt1}$ equation is defined as:

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$. The $T_{interrupt2}$ equation is defined as:

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

T_{MC} is 0 ms if a single UTRA cell is configured as the handover target, otherwise 20 ms if handover to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the UTRA primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one "in_sync" is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.2.

5.2.2.4 Test description

5.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for call setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.2.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD handover

Parameter		Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
	Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Final conditions	Active cell		Cell 2	
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (UTRA FDD) measurement quantity			CPICH Ec/Io	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	UTRAN FDD CPICH Ec/Io threshold for event B2
Hysteresis		dB	0	
DRX			OFF	No DRX configured.
Time to Trigger		ms	0	
Filter coefficient			0	
CP length			Normal	Applicable to cell 1
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell list before T2.
Post-verification period			False	Post verification is not used.
T1		s	5	
T2		s	≤5	
T3		s	1	

5.2.2.4.2 Test procedure

The test consists of one E-UTRAN TDD cell and one neighbour UTRAN FDD cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before the start of T2 to enable the monitoring of UTRAN FDD. A neighbouring cell list, including the UTRA cell (Cell 2) is sent to the UE before T2 starts. During the time T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.2.2.5-1 and 5.2.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.2.5-1 and 5.2.2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.2.5-1 and 5.2.2.5-2.
9. If the UE transmits the Uplink DPCCH channel to Cell 2 less than 190 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100) for next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.2.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN FDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.2.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)-			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
Threshold-RSRP	50 (-90dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18dB)	-18 dB is actual UTRA-Thres is actual Ec/NO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.2.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.2.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	This is the typical value range used in UTRAN FDD tests.	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.2.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		

5.2.2.5 Test requirement

Tables 5.2.2.4.1-1, 5.2.2.5-1 and 5.2.2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD handover test.

Table 5.2.2.5-1: Cell specific test parameters for E-UTRAN TDD (cell 1) for handover to UTRAN FDD (cell # 2)

Parameter	Unit	Cell 1 (E-UTRAN)		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.1 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA^{Note}				
OCNG_RB^{Note}				

RSRP	dBm/15 kHz	-99.10	-99.10	-99.10
$\hat{E}_s/I_{oc}$	dB	-1.10	-1.10	-1.10
$\hat{E}_s/N_{oc}$	dB	-1.10	-1.10	-1.10
N_{oc}	dBm/15 kHz	-98		
Propagation Condition		AWGN		
Note: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.2.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
DPCH_Ec/Ior	dB	N/A	N/A	Note 1
OCNS_Ec/Ior	dB	-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8	-1.8
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io	dB	-infinity	-14	-14
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$ (note: the target cell is known)

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

T_{MC} = 0 ms if a single UTRA cell is configured as the handover target. Otherwise T_{MC} = 20 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 190 ms in this test case (note: this gives a total of 50ms for maximum RRC procedure delay plus 140 ms for Tinterrupt1).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.3 E-UTRAN FDD - GSM handover

5.2.3.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM in RRC_CONNECTED state by meeting the UE handover delay and interruption time requirements.

5.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, 15 and 23.

5.2.3.3 Minimum conformance requirements

The handover delay given in table 5.2.3.3-1 and interruption time given in table 5.2.3.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.3.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-2.

Table 5.2.3.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.3.

5.2.3.4 Test description

5.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.3.4.3.
5. There is one E-UTRA FDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.3.4.1-1: General Test Parameters for E-UTRAN FDD - GSM handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id			1	As specified in TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Inter-RAT measurement quantity			GSM Carrier RSSI	
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
T1		s	20	
T2		s	7	
T3		s	1	

5.2.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. The RRC message implying handover to Cell 2 shall be sent to the UE during T2, after the UE has reported Event B1. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover. The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern is sent.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.3.5-1 and 5.2.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.3.5-1 and 5.2.3.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.3.5-2. T3 starts.
9. If the UE sends access bursts on the new DCCH to Cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.3.4.3-1: Common Exception messages for E-UTRAN FDD - GSM handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-6 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.3.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.3.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	

Table 5.2.3.4.3-4: *MeasResults*: Additional E-UTRAN FDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.3.4.3-5: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

5.2.3.5 Test requirement

Tables 5.2.3.4.1-1, 5.2.3.5-1 and 5.2.3.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM handover test case.

Table 5.2.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1	
		T1, T2	**T3**
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s/I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)	
$\hat{E}_s/N_{oc}$	dB	4	

RSRP Note 3	dBm/15kHz	-94
Propagation Condition		AWGN
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 5.2.3.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{\text{Handover delay}}$ test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 90 ms; this is based on handover delay value as defined in Table 5.2.3.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{\text{Handover delay}}$ shall be less than a total of 100 ms in this test case (note: this gives a total of 99.29 ms but the test allows 100 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.4 E-UTRAN TDD - UTRAN TDD handover

5.2.4.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.4.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 8, and 22.

5.2.4.3 Minimum conformance requirements

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within D_{handover} seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure performance value plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + 20 + 10*F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{offset} + T_{UL} + 30*F_{SFN} + 180 + 10*F_{max} \text{ ms}$$

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.4.

5.2.4.4 Test description

5.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.4.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.4.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRA TDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub-Channel Number			1	No additional delays in random access procedure due to ASC.
Hysteresis		dB	0	
Time To Trigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Hys		dB	0	
Thresh1		dBm	-93	E-UTRA event B2 threshold
Thresh2		dBm	-80	UTRA event B2 threshold
T1		s	5	
T2		s	≤10	
T3		s	1	

5.2.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A neighbouring cell list, including the UTRA cell (Cell 2) is sent to the UE before T2 starts. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.4.5-1 and 5.2.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.4.5-1 and 5.2.4.5-2. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.4.5-1 and 5.2.4.5-2. T3 starts.

9. If the UE transmits the UL to Cell 2 less than 120 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. The SS shall set Cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.4.4.3-1: Common Exception messages for E-UTRA TDD to UTRA TDD cell handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.4.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	47 (-93 dBm)	-93 dBm EUTRA-Thres is actual threshold value in dBm (47 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2 UTRA CHOICE {			
utra-RSCP	35 (-80 dB)	-80 dB is actual UTRA-Thres is actual RSCP value in dB (35 - 115 dBm)	
}			
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.4.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	This is the typical value range used in UTRAN TDD tests.	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

Table 5.2.4.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
CHOICE channel requirement	Uplink DPCH info		
- CHOICE mode	TDD		
- Uplink Timing Advance Control			
- CHOICE Timing Advance	enabled		
- CHOICE TDD option	1.28 Mcps		
- Uplink synchronization parameters			
- Uplink synchronization step size	1		
- Uplink synchronization frequency	1		
- Synchronization parameters			
- SYNC_UL codes bitmap	"11111111"		
- FPACH info			
- Timeslot number	0		
- Channelisation code	(16/15)		
- Midamble Shift and burst type			
- CHOICE TDD option	1.28 Mcps TDD /REL-4/		
- Midamble Allocation Mode	Default midamble		
- Midamble configuration	4 (k=8)		
- Midamble Shift	Not present		
- WT	4		
- $PRX_{UpPCHdes}$	15(-105dBm)		
- SYNC_UL procedure	Not present		
- Activation time	Not Present		
Downlink information common for all radio links			

Information Element	Value/remark	Comment	Condition
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		
-Downlink information for each radio links			
- CHOICE mode	TDD		
- Primary CCPCH info			
- Downlink DPCH info for each RL			
- CHOICE mode	TDD		
- Activation time	Not Present		

5.2.4.5 Test requirement

Tables 5.2.4.4.1-1, 5.2.4.5-1 and 5.2.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD handover test.

Table 5.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD to UTRA TDD handover test case (Cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		**OP.1 TDD**		**OP.2 TDD**
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	15.10	-3	-3
$\hat{E}_s/N_{oc}$	dB	15.10	-3	-3
N_{oc}	dBm/15kHz	-99.05		
RSRP	dBm/15kHz	-83,95	-102.05	-102.05
SCH_RP	dBm/15 kHz	-83.95	-102.05	-102.05
Io Note 2	dBm/9MHz	-56.04	-69.50	-69.50
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.2.4.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number Note 1		2					
PCCPCH_Ec/Ior	dB	-3					
DwPCH_Ec/Ior	dB				0		
OCNS_Ec/Ior	dB	-3					
$\hat{I}_{or}/I_{oc}$	dB	-3	12.6	12.6	-3	12.6	12.6
I_{oc}	dBm/1.28 MHz	-80.8					
PCCPCH RSCP	dBm	-86.8	-71.2	-71.2	n.a.		
Io Note 2	dBm/1.28 MHz	-79.04	-67.97	-67.97	-79.04	-67.97	-67.97
Propagation Condition		AWGN					

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: PCCPCH_RSCP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

$D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$

$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max}$ ms

T_{offse}= 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2.

The handover delay $D_{handover}$ shall be less than a total of 120 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.5 E-UTRAN FDD - UTRAN TDD handover

5.2.5.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN FDD to UTRAN TDD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.5.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 8, and 22.

5.2.5.3 Minimum conformance requirements

5.2.5.3.1 void

5.2.5.3.2 1.28Mcps TDD option

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$.

$$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$.

$$T_{interrupt2}= T_{offset}+T_{UL}+30*F_{SFN}+ 180 +10*F_{max} \text{ ms}$$

Where:

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
F_{max}	denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.5.

5.2.5.3.2 void

5.2.5.4 Test description

5.2.5.4.1 void

5.2.5.4.2 1.28Mcps TDD option

5.2.5.4.2.1Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.5.4.3.
5. There is one E-UTRA FDD serving cell and one UTRATDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.5.4.2.1-1: General Test Parameters for E-UTRAN FDD - UTRAN TDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRA FDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			1	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN FDD measurement quantity			RSRP	
UTRAN TDD measurement quantity			P-CCPCH RSCP	
CP length of cell 1			Normal	
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub-Channel Number			1	No additional delays in random access procedure due to ASC.
Hysteresis		dB	0	
Time To Trigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Hys		dB	0	
Thresh1		dBm	-93	Absolute E-UTRAN RSRP threshold for event B2
Thresh2		dBm	-80	Absolute UTRAN P-CCPCH RSCP threshold for event B2
T1		s	5	
T2		s	≤ 10	
T3		s	1	

5.2.5.4.2.2 Test procedure

The test scenario comprises of two cells, E-UTRA TDD cell1 and UTRA TDD cell2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #1 as specified in TS 36.133 [4] Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.5.5.2-1 and 5.2.5.5.2-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.5.5.2.-1 and 5.2.5.5.2-2.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.5.5-1 and 5.2.5.5-2.

9. If the UE transmits the UL DPCH Cell 2 less than 120 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. SS shall change set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.5.4.2.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.5.4.2.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.5.4.2.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	47 (-93 dBm)	-93 dBm EUTRA-Thres is actual threshold value in dBm (46 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2UTRA CHOICE {			
utra-RSCP	35 (-80 dBm)	-80 dBm is actual UTRA-Thres is actual RSCP value in dBm (36-115dBm)	
}			
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 5.2.5.4.2.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.5.4.2.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

Table 5.2.5.4.2.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
CHOICE channel requirement	Uplink DPCH info		
- CHOICE mode	TDD		
- Uplink Timing Advance Control			
- CHOICE Timing Advance	enabled		
- CHOICE TDD option	1.28 Mcps		
- Uplink synchronization parameters			
- Uplink synchronization step size	1		
- Uplink synchronization frequency	1		
- Synchronization parameters			
- SYNC_UL codes bitmap	"11111111"		
- FPACH info			
- Timeslot number	0		
- Channelisation code	(16/15)		
- Midamble Shift and burst type			
- CHOICE TDD option	1.28 Mcps TDD /REL-4/		
- Midamble Allocation Mode	Default midamble		
- Midamble configuration	4 (k=8)		
- Midamble Shift	Not present		
- WT	4		
- $PRX_{UpPCHdes}$	15(-105dBm)		
- SYNC_UL procedure	Not present		
- Activation time	Not present		
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		
-Downlink information for each radio links			
- CHOICE mode	TDD		
- Primary CCPCH info			
- Downlink DPCH info for each RL			
- CHOICE mode	TDD		
- Activation time	Not Present		

5.2.5.4.3 7.68 Mcps TDD option

Editor's note: FFS

5.2.5.5 Test requirement

5.2.5.5.1 3.84Mcps TDD option

Editor's note: FFS

5.2.5.5.2 1.28Mcps TDD option

Tables 5.2.5.4.2.1-1, 5.2.5.5.2-1 and 5.2.5.5.2-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD handover test.

Table 5.2.5.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note 1]	dB			
OCNG_RB[Note 1]	dB			
$\hat{E}_s/N_{oc}$	dB	11 + TT	-3 + TT	-3+ TT
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s/I_{ot}$	dB	11 + TT	-3 + TT	-3+ TT
RSRP	dBm/15 KHz	-87 + TT	-101 + TT	-101+ TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.5.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number*		Channel 2					
PCCPCH_Ec/Ior	dB	-3					
DwPCH_Ec/Ior	dB				0		
OCNS_Ec/Ior	dB	-3					
$\hat{I}_{or}/I_{oc}$	dB	-3 TT	11 TT	11 TT	-3 TT	11 TT	11 TT
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86 TT	-72 TT	-72 TT	n.a.		
Propagation Condition		AWGN					
* Note: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt1} = T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max}$ ms

T_{offse}= 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 120 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.5.5.2 7.68 Mcps TDD option

Editor's note: FFS

5.2.6 E-UTRA TDD - GSM handover

5.2.6.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM in RRC_CONNECTED state by meeting the UE handover delay and interruption time requirements.

5.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, 15 and 23.

5.2.6.3 Minimum conformance requirements

The handover delay $T_{Handover}$ delay shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.6.3-1 and interruption time given in table 5.2.6.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.6.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.6.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.2 and shown in table 5.2.6.3-2:

Table 5.2.6.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.6.

5.2.6.4 Test description

5.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.6.4.3.
5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.6.4.1-1: General Test Parameters for E-UTRAN TDD - GSM handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			1	As specified in TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1			Normal	
Inter-RAT measurement quantity			GSM Carrier RSSI	
E-UTRA RF Channel Number			1	E-UTRA RF Channel Number
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	E-UTRA Channel Bandwidth ($BW_{channel}$)
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
T1		s	20	
T2		s	7	
T3		s	1	

5.2.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. The RRC message implying handover to Cell 2 shall be sent to the UE during T2, after the UE has reported Event B1. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover. The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern is sent.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.6.5-1 and 5.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.6.5-1 and 5.2.6.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.6.5-2. T3 starts.
9. If the UE sends access bursts on the new DCCH to Cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

11. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.6.4.3-1: Common Exception messages for E-UTRAN TDD - GSM handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-6 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.6.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.6.4.3-3: ReportConfigInterRAT-B1-GERAN: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-Threshold-GERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	

Table 5.2.6.4.3-4: MeasResults: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.6.4.3-5: MeasResultListGERAN: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
CarrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC) and is used %%	
}			
Cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdGERAN		
routingAreaCode	Not present		
}			
measResult SEQUENCE {			
Rssi		Set according to specific test	
}			
}			

5.2.6.5 Test requirement

Tables 5.2.6.4.1-1, 5.2.6.5-1 and 5.2.6.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM handover test case.

Table 5.2.6.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1, T2	**T3**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s/N_{oc}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)	
$\hat{E}_s/I_{ot}$	dB	4	
RSRP Note 3	dBm/15kHz	-94	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.2.6.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	**T2, T3**
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{Handover\ delay}$ test requirement in this case is expressed as:

Handover delay $T_{Handover\ delay}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 90 ms; this is based on handover delay value as defined in Table 5.2.6.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{Handover\ delay}$ shall be less than a total of 100 ms in this test case (note: this gives a total of 99.3 ms but the test allows 100 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell

5.2.7.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.2.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 8, and 22.

5.2.7.3 Minimum conformance requirements

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$.

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} + T_{MC} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$.

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell. If HS-PDSCH is configured in the UTRA target cell, F_{max} is 4 radio frames.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

T_{MC} is 0 ms if a single UTRA cell is configured as the handover target, otherwise 20 ms if handover to UTRA with 1, 2 or 3 UTRA carriers with secondary HS-PDSCH is configured.

The phase reference is the primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one in-sync is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.7.

5.2.7.4 Test description

5.2.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.7.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.7.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.7.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		s	≤5	
T2		s	1	

5.2.7.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.7.5-1 and 5.2.7.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Tables 5.2.7.5-1 and 5.2.7.5-2. T2 starts.
5. If the UE transmits the UL DPCCH to Cell 2 less than 290 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.7.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-1 Table H.3.3-3

Table 5.2.7.4.3-2: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		

5.2.7.5 Test requirement

Tables 5.2.7.4.1-1, 5.2.7.5-1 and 5.2.7.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test.

Table 5.2.7.5-1: Cell Specific Test requirement Parameters for Cell 1 in E-UTRAN FDD - UTRAN FDD handover: unknown target cell test

Parameter	Unit	Cell 1 (E-UTRA)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	0	0
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	0	0
RSRP Note 3	dBm/15 KHz	-98	-98
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.2.7.5-2: Cell Specific Test requirement Parameters for Cell 2 in E-UTRAN - UTRAN FDD handover: unknown target cell test

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DCH_Ec/Ior	dB	Note 1	
OCNS_Ec/Ior	dB	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8
I_{oc}	dBm/3,84 MHz	-70	-70
CPICH_Ec/Io	dB	-infinity	-14
Propagation Condition	AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover to an unknown target cell delay test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt2}$ (note: the target cell is unknown)

$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} + T_{MC}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

T_{MC} = 0 ms if a single UTRA cell is configured as the handover target. Otherwise T_{MC} = 20 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover to an unknown target cell delay shall be less than a total of 290 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 240 ms for $T_{interrupt2}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.8 E-UTRAN FDD - GSM handover: unknown target cell

5.2.8.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.2.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, and 23.

5.2.8.3 Minimum conformance requirements

The handover delay $T_{Handover\ delay}$ shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.8.3-1 and interruption time given in table 5.2.8.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.8.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.8.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.8.3-2.

Table 5.2.8.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.8.

5.2.8.4 Test description

5.2.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.8.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.8.4.3.
5. There is one E-UTRA FDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.8.4.1-1: General Test Parameters for E-UTRAN FDD - GSM handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
T1		s	≤7	
T2		s	1	

5.2.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.8.5-1 and 5.2.8.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own BSIC, SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.8.5-1 and 5.2.8.5-2. T2 starts.
5. If the UE sends access bursts on the new DCCH to Cell 2 less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.8.4.3-1: Common Exception messages for E-UTRAN FDD - GSM handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-2 Table H.3.3-3

Table 5.2.8.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

5.2.8.5 Test requirement

Tables 5.2.8.4.1-1, 5.2.8.5-1 and 5.2.8.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM handover: unknown target cell test.

Table 5.2.8.5-1: Cell Specific Test requirement Parameters for Cell 1 in E-UTRAN FDD - GSM handover: unknown target cell test

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s/I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	
RSRP Note 3	dBm/15 kHz	-94	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.2.8.5-2: Cell Specific Test requirement Parameters for Cell 2 in E-UTRAN FDD - GSM handover: unknown target cell test

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover to an unknown target cell delay test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 190 ms; this is based on handover delay value as defined in Table 5.2.3.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover to an unknown target cell delay shall be less than a total of 200 ms in this test case (note: this gives a total of 199.3 ms but the test allows 200 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.9 E-UTRAN TDD - GSM handover: unknown target cell

5.2.9.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN TDD to GSM in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements when the target cell is unknown.

5.2.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM and inter-RAT PS handover to GERAN. Applicability requires support for FGI bits 9, and 23.

5.2.9.3 Minimum conformance requirements

The handover delay given in table 5.2.9.3-1 and interruption time given in table 5.2.9.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.9.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.9.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.2 and shown in table 5.2.9.3-2.

Table 5.2.9.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.9.

5.2.9.4 Test description

5.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

2. The general test parameter settings are set up according to Table 5.2.9.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 5.2.9.4.3.

5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.9.4.1-1: General Test Parameters for E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211 [8]
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211 [8]
T1		s	7	
T2		s	1	

5.2.9.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.9.5-1 and 5.2.9.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own BSIC, SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, At that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.9.5-1 and 5.2.9.5-2. T2 starts.
5. If the UE sends access bursts on the new DCCH to Cell 2 less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.9.4.3-1: Common Exception messages for E-UTRAN TDD - GSM handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-2 Table H.3.3-3

Table 5.2.9.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

5.2.9.5 Test requirement

Tables 5.2.9.4.1-1, 5.2.9.5-1 and 5.2.9.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM handover test case when the target cell is unknown.

Table 5.2.9.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD GSM handover: unknown target cell test

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s/I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	

RSRP Note 3	dBm/15 kHz	-94
Propagation Condition		AWGN
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 5.2.9.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN TDD – GSM handover: unknown target cell test

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{\text{Handover delay}}$ test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 190 ms; this is based on handover delay value as defined in Table 5.2.9.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{\text{Handover delay}}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 199.3 ms but the test allows 200 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.10 E-UTRAN TDD - UTRAN TDD handover: unknown target cell

5.2.10.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN TDD to UTRAN TDD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements when the target cell is unknown.

5.2.10.2 Test applicability

This test applies to all types of release 8 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 8, and 22.

5.2.10.3 Minimum conformance requirements

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within D_{handover} seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2}= T_{offset}+T_{UL}+30*F_{SFN}+180 +10*F_{max} \text{ ms}$$

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.10.

5.2.10.4 Test description

5.2.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.10.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.10.4.1-1: General test parameters for E-UTRA TDD to unknown UTRA (1.28 Mcps TDD OPTION) handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD cell
Final conditions	Active cell		Cell 2	UTRA 1.28Mcps TDD cell
CP length of cell 1			Normal	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information			Not Sent	No additional delays in random access procedure.
Assigned Sub-Channel Number			1	No additional delays in random access procedure due to ASC.
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		s	5	During T1, cell 2 shall be powered off, and during the off time the physical layer cell identity shall be changed.
T2		s	1	

5.2.10.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, a RRC message implying handover to UTRA 1.28Mcps TDD cell shall be sent to the UE including activation time "now". The end of the last TTI containing handover message is the beginning of T2 duration.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Tables 5.2.10.5-1 and 5.2.10.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, At that instant the SS shall switch the power settings from T1 to T2 as specified in Tables 5.2.10.5-1 and 5.2.10.5-2. T2 starts.
5. If the UE transmits the UL to Cell 2 less than 280ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
7. The SS shall set Cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.10.4.3-1: Common Exception messages for E-UTRA TDD to unknown UTRA TDD cell handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.3-1 Table H.3.3-3

Table 5.2.10.4.3-2: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark	Comment	Condition
CHOICE channel requirement	Uplink DPCH info		
- CHOICE mode	TDD		
- Uplink Timing Advance Control			
- CHOICE Timing Advance	enabled		
- CHOICE TDD option	1.28 Mcps		
- Uplink synchronization parameters			
- Uplink synchronization step size	1		
- Uplink synchronization frequency	1		
- Synchronization parameters			
- SYNC_UL codes bitmap	"11111111"		
- FPACH info			
- Timeslot number	0		
- Channelisation code	(16/15)		
- Midamble Shift and burst type			
- CHOICE TDD option	1.28 Mcps TDD /REL-4/		
- Midamble Allocation Mode	Default midamble		
- Midamble configuration	4 (k=8)		
- Midamble Shift	Not present		
- WT	4		
- $PRX_{UpPCHdes}$	15(-105dBm)		
- SYNC_UL procedure	Not present		
- Activation time	Not Present		
Downlink information common for all radio links			
- Downlink DPCH info common for all RL			
- Timing indicator	Initialize		
- Default DPCH Offset Value	Arbitrary set to value 0..306688 by step of 512		
-Downlink information for each radio links			
- CHOICE mode	TDD		
- Primary CCPCH info			
- Downlink DPCH info for each RL			
- CHOICE mode	TDD		
- Activation time	Not Present		

5.2.10.5 Test requirement

Tables 5.2.10.4.1-1, 5.2.10.5-1 and 5.2.10.5-2 define the primary level settings including test tolerances for E-UTRAN TDD to unknown UTRAN TDD cell handover test.

Table 5.2.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case (cell1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
BWchannel	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA (Note 1)	dB		
OCNG_RB (Note 1)	dB		
$\hat{E}_s/I_{ot}$	dB	3	3
$\hat{E}_s/N_{oc}$	dB	3	3
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-95	-95
SCH_RP	dBm/15 kHz	-95	-95
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.2.10.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 2			
PCCPCH_Ec/Ior	dB	-3			
DwPCH_Ec/Ior	dB			0	
OCNS_Ec/Ior	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-infinity	13	-infinity	13
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-infinity	-70	n.a.	
Propagation Condition		AWGN			
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note2: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit SYNCH-UL sequence in the UpPTS to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

$D_{handover}$ = maximum RRC procedure delay + $T_{interrupt2}$

$T_{interrupt2} = T_{offset} + T_{UL} + 30*F_{SFN} + 180 + 10*F_{max}$ ms

T_{offset} = 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2.

The handover delay $D_{handover}$ shall be less than a total of 280 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.11 E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth

5.2.11.1 Test purpose

Same test purpose as in clause 5.2.1.1.

5.2.11.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD and only Band 31. Applicability requires support for FGI bits 8, and 22.

5.2.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 5.2.1.3 with the following exceptions:

- Instead of A.5.2.1 → use A.5.2.11.

5.2.11.4 Test description

5.2.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.2.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.11.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.11.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
E-UTRA Channel Bandwidth (BWchannel)	MHz	5	
Note 1: See Table 5.2.1.4.1-1 for other general test parameters. Note 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

5.2.11.4.2 Test procedure

Same test procedure as in clause 5.2.1.4.2 with the following exceptions:

- Instead of Table 5.2.1.5-1 → use Table 5.2.11.5-1.

5.2.11.4.3 Message contents

Same message contents as in clause 5.2.1.4.3.

5.2.11.5 Test requirement

Same test requirement as in clause 5.2.1.5 with the following exceptions:

Tables 5.2.11.4.1-1, 5.2.11.5-1 and 5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover test.

Table 5.2.11.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD to UTRAN FDD handover test case (Cell 1)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 **FDD**
Io Note 2	dBm/4.5 MHz	-70.73	-70.73	-70.73
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 5.2.1.5-1 for other cell specific test parameters.				

5.3 Handover from E-UTRAN to non-3GPP RATs

5.3.1 E-UTRAN FDD - HRPD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined: Protocol procedure for the test state is under discussion.

- The Test system uncertainties applicable above 3GHz are undefined
- The Test Tolerances and Test Requirements applicable above 3GHz are undefined

5.3.1.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD. Applicability requires support for FGI bits 12, and 26.

5.3.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O \text{ ms}$$

Where:

T_{IU}	It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).
SW_K	is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message
SW_O	is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message
KC	It is the number of known target HRPD cells in the message, and
OC	It is the number of unknown target HRPD cells in the message.

Note: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.1.

5.3.1.4 Test description

5.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.3.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.1.4.3.
5. There is one E-UTRA FDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.1.4.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (HRPD) measurement quantity			CDMA2000 HRPD Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in [State 3B-RF] according to TS 36.508 [7] clause [7.2A.4]. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.1.5-1 and 5.3.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.1.5-1 and 5.3.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. The SS transmits a *HandoverFromEUTRAPreparationRequest* on Cell 1.
8. The UE transmit tunnelled HRPD *Connection Request* and *Route Update* messages contained in an *ULHandoverPreparationTransfer* message on Cell 1.
9. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2. The tunnelled HRPD *Traffic Channel Assignment, HRPD Silence Parameters* and *HRPD Open Loop Parameters* messages are contained in *MobilityFromEUTRACommand.*
10. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.1.5-1 and 5.3.1.5-2.
11. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
12. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3B according to TS 36.508 [7] clause 4.5.3B. Cell 1 is the active cell.
13. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
14. Repeat steps 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions.

Table 5.3.1.4.3-1: Common Exception messages for E-UTRAN FDD - HRPD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-8 Table H.3.3-3 Table H.3.3-4

Table 5.3.1.4.2-2: MeasObjectCDMA2000: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.508, Table 4.6.6-1C			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectCDMA2000-GENERIC ::= SEQUENCE {			
cdma2000-Type	TypeHRPD		
carrierFreq SEQUENCE {			
bandClass	Band Class of frequency under test		
Arfcn	f14		
}			
searchWindowSize	8		
offsetFreq	db0		
cellsToRemoveList	Not present		
cellsToAddModList CHOICE {			
cellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE {			
cellIndex [1]	1		
physCellId [1]	PN offset of Cell 2		
cellIndex [2]	2		
physCellId [2]	PN offset of Cell 2 + 4		
cellIndex [3]	3		
physCellId [3]	PN offset of Cell 2 + 8		
cellIndex [4]	4		
physCellId [4]	PN offset of Cell 2 + 12		
cellIndex [5]	5		
physCellId [5]	PN offset of Cell 2 + 16		
cellIndex [6]	6		
physCellId [6]	PN offset of Cell 2 + 20		
cellIndex [7]	7		
physCellId [7]	PN offset of Cell 2 + 24		
cellIndex [8]	8		
physCellId [8]	PN offset of Cell 2 + 28		
}			
}			
cellForWhichToReportCGI	Not present		
}			

Table 5.3.1.4.3-3: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	14 (-7 dB)	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.1.4.3-4: *MeasuredResults*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.1.4.3-5: *MeasResultListCDMA2000*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 2		
cgi-Info	Not present		
measResult SEQUENCE {			
pilotPnPhase		Set according to specific test	
pilotStrength		Set according to specific test	
}			
}			

Table 5.3.1.4.3-6: *HandoverFromEUTRAPreparationRequest*

Derivation Path: 36.508 Table 4.6.1-4			
Information Element	**Value/remark**	**Comment**	**Condition**
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
handoverFromEUTRAPreparationRequest-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Rand	Not present		
mobilityParameters	Not present		
}			
}			
}			
}			

Table 5.3.1.4.3-7: *ULHandoverPreparationTransfer*

Derivation Path: 36.508 Table 4.6.1-24			
Information Element	**Value/remark**	**Comment**	**Condition**
ULHandoverPreparationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulHandoverPreparationTransfer-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Meid	Not present		
dedicatedInfo	Set according to Table 8.4.5.4.3.3-7	HRPD Connection Request and Route Update	
}			
}			
}			
}			

Table 5.3.1.4.3-8: *HRPD Connection Request*

Information Element	Value/remark	Comment	Condition
SAPState	‘0’B	SAP Header	

SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by UE		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'0000001'	Connection Request	
TransactionID	Any allowed value	8 bit field	
RequestReason	'0000'	Access Terminal Initiated	

Table 5.3.1.4.3-9: *HRPD Route Update*

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by UE		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'0000000'B	Route Update	
MessageSequence	8 bits, Set by UE		
ReferencePilotPN	9 bits, Set by UE		
ReferencePilotStrength	6 bits, Set by UE		
ReferenceKeep	'1'B		
NumPilots	'0000'B		
CompatibleReserved	'0'B		
ReferencePilotChannelIncluded	'1'B		
ReferencePilotChannel	24 bits, Set by UE		
ReferencePilotArrivalIncluded	'1'B		
ReferencePilotArrival	15 bits, Set by UE		
Reserved	0-7 bits, Set all 0s by UE		

Table 5.3.1.4.3-10: *HRPD Traffic Channel Assignment*

Information Element	Value/remark	Comment	Condition
SAPState	'1'B	SAP Header	
SessionConfigurationToken	'0'B		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'00000001'B	Traffic Channel Assignment	
MessageSequence	Set by SS	8 bit field	
ChannelIncluded	'1'B	Channel record included	
Channel	'000000000000000001111010'B	channel record for Cell 15	
FrameOffset	'1010'B	frame offset for Cell 15	
DRCLength	'01'B	DRCLength for Cell 15	
DRCChannelGainBase	'111101'B	ratio of the power level of the DRC Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
ACKChannelGain	'000110'B	ratio of the power level of the Ack Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
NumPilots	'1'B		
PilotPN	'000110010'B	PN Offset of target sector (Cell 15)	
SofterHandoff	'0'B	Set to '0'since only 1 pilot included in message	
MACIndexLSBs	Set by SS	6 least significant bits of the MACIndex assigned to UE	
DRCCover	'001'B	index of the DRC cover associated with target sector (Cell 15)	
RABLength	'01'B	2 bit field	
RABOffset	'010'B	3 bit field	

Table 5.3.1.4.3-11: *HRPD Silence Parameters*

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'00000010'B		
ReverseLinkSilenceDuration	2 bits, Set by SS		
ReverseLinkSilencePeriod	2 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

Table 5.3.1.4.3-12: *HRPD Open Loop Parameters*

Information Element	Value/remark	Comment	Condition
SAPState	'0'B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
MessageID	'00000111'B		
NumPilots	'0001'B		
PilotPN	9 bits, Set by SS		
OpenLoopAdjust	8 bits, Set by SS		
InitialAdjust	5 bits, Set by SS		
PilotStrengthIncluded	1 bit, Set by SS		
PilotStrengthNominal	3 bits, Set by SS		
PilotStrengthCorrectionMin	3 bits, Set by SS		
PilotStrengthCorrectionMax	3 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

5.3.1.5 Test requirement

Tables 5.3.1.4.1-1, 5.3.1.5-1 and 5.3.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD handover test.

Table 5.3.1.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			

N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)		
RSRP Note 3	dBm/15 KHz	-98.80	-98.80	-98.80
$\hat{E}_s/N_{oc}$	dB	-0.8	-0.8	-0.8
$\hat{E}_s/I_{ot}$	dB	-0.8	-0.8	-0.8
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.1.5-2: Cell Specific Test requirement Parameters for Cell 2 HRPD cell

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	T3
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21		
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0	0
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of HRPD chips (60) indicated by the search window for known target HRPD cells in the message

KC = 1; 1 known cell; HRPD cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target HRPD cells (0).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.2 E-UTRAN FDD - cdma2000 1xRTT handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Mobility From EUTRA Command message parameters are undefined

InterRAT-Target and InterRAT-Message field description is FFS

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.2.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bits 11, and 24.

5.3.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC It is the number of known target cdma2000 1xRTT cells in the message, and

OC It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.2.

5.3.2.4 Test description

5.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.3.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.2.4.3.
5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.2.4.1-1: General test parameters for E-UTRAN FDD to cdma2000 1xRTT handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (cdma2000 1X) measurement quantity			CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in FFS according to TS 36.508 [7] clause FFS. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.3.2.5-1 and 5.3.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.2.5-1 and 5.3.2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.2.5-1 and 5.3.2.5-2.
9. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
11. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
12. Repeat steps 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.2.5 Test requirement

Tables 5.3.2.4.1-1, 5.3.2.5-1 and 5.3.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT handover test.

Table 5.3.2.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)		
RSRP Note 3	dBm/15 KHz	-98 + TT	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT	0 +TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT	0 + TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.2.5-2: Cell Specific Test requirement Parameters for Cell 2 cdma2000 1xRTT cell

Parameter	Unit	Cell 2 (cdma2000 1X)		
		T1	T2	T3
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16		
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT	0 + TT
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10 + TT	-10 + TT
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips (60) indicated by the search window for known target cdma2000 1xRTT cells in the message

KC = 1; 1 known cell; cdma2000 1xRTT cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target cdma2000 1xRTT cells (0).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.3 E-UTRAN FDD - HRPD handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The MobilityFromEUTRACommand message parameters are undefined

targetRAT-Type and targetRAT-MessageContainer field descriptions are FFS

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.3.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD. Applicability requires support for FGI bits 12, and 26.

5.3.3.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).

SW_K is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message

SW_O is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message

KC It is the number of known target HRPD cells in the message, and

OC It is the number of unknown target HRPD cells in the message.

NOTE: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.3.

5.3.3.4 Test description

5.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.3.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.3.4.3.
5. There is one E-UTRA FDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.3.4.1-1: General test parameters for E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	≤5	
T2		s	1	

5.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting at T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in [State 3B-RF] according to TS 36.508 [7] clause [7.2A.4]. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.3.3.5-1 and 5.3.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS shall transmit the message containing Information Element systemTimeInfo as defined in TS 36.331 [5] clause 6.3.1. The neighbour cell shall broadcast its own PN offset. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
6. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table's 5.3.3.5-1 and 5.3.3.5-2.
7. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.3.5 Test requirement

Tables 5.3.3.4.1-1, 5.3.3.5-1 and 5.3.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD handover: unknown target cell test.

Table 5.3.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter	Unit	Cell 1 (E-UTRAN FDD)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.3.3.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter	Unit	Cell 2 (HRPD)	
		T1	T2
Control $\frac{E_b}{N_t}$ (38.4 kbps)	dB	21	
Control $\frac{E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3 + TT
Propagation Condition		AWGN	

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_O = 1$; $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips (60) indicated by the search window for unknown target HRPD cells in the message

KC = 0; KC is the number of known target HRPD cells (0).

OC = 1; OC is the number of unknown target HRPD cells (1).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.4 E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Mobility From EUTRA Command message parameters are undefined

targetRAT-Type and targetRAT-MessageContainer field descriptions are FFS

The Message contents are undefined

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.4.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.3.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bits 11, and 24.

5.3.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K is $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message

SW_O is $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC It is the number of known target cdma2000 1xRTT cells in the message, and

OC It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.4.

5.3.4.4 Test description

5.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

2. The general test parameter settings are set up according to Table 5.3.4.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.3.4.4.3.

5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.4.4.1-1: General test parameters for E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	≤5	
T2		s	1	

5.3.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting at T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in FFS according to TS 36.508 [7] clause FFS. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.3.4.5-1 and 5.3.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS shall transmit the message containing Information Element systemTimeInfo as defined in TS 36.331 [5] clause 6.3.1. The neighbour cell shall broadcast its own PN offset. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
6. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table's 5.3.4.5-1 and 5.3.4.5-2.
7. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.4.5 Test requirement

Tables 5.3.4.4.1-1, 5.3.4.5-1 and 5.3.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell test.

Table 5.3.4.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter	Unit	Cell 1 (E-UTRAN FDD)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.3.4.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter	Unit	Cell 2 (cdma2000 1X)	
		T1	T2
Pilot $\frac{E_c}{I_{or}}$	dB	-7	
Sync $\frac{E_c}{I_{or}}$	dB	-16	
Paging $\frac{E_c}{I_{or}}$ (4.8 kbps)	dB	-12	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10 + TT
Propagation Condition		AWGN	

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_O = 1; SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips (60) indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC = 0; KC is the number of known target cdma2000 1xRTT cells (0).

OC = 1; OC is the number of unknown target cdma2000 1xRTT cells (1).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.5 E-UTRAN TDD - HRPD handover

Editor's note: This Test case is incomplete for frequencies above 3GHz

- The Test system uncertainties applicable above 3GHz are undefined
- The Test Tolerances and Test Requirements applicable above 3GHz are undefined

5.3.5.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support HRPD. Applicability requires support for FGI bits 12, and 26.

5.3.5.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O \text{ ms}$$

Where:

T_{IU}	It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).
SW_K	is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message
SW_O	is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message
KC	It is the number of known target HRPD cells in the message, and
OC	It is the number of unknown target HRPD cells in the message.

Note: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.5.

5.3.5.4 Test description

5.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.

2. The general test parameter settings are set up according to Table 5.3.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.3.5.4.3.

5. There is one E-UTRA TDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.5.4.1-1: General test parameters for E-UTRAN TDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (HRPD) measurement quantity			CDMA2000 HRPD Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.5.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in [State 3B-RF] according to TS 36.508 [7] clause 7.2A.4. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.5.4.4-1 and 5.3.5.4.4-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.5.4.4-1 and 5.3.5.4.4-2.

6. The UE shall transmit a MeasurementReport message triggered by Event B2.

7. The SS transmits a *HandoverFromEUTRAPreparationRequest* on Cell 1.

8. The UE transmits tunnelled HRPD *Connection Request* and *Route Update* messages contained in an *ULHandoverPreparationTransfer* message on Cell 1.

9. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2. The tunnelled HRPD *Traffic Channel Assignment*, *HRPD Silence Parameters* and *HRPD Open Loop Parameters* messages are contained in *MobilityFromEUTRACommand.*

10. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.5.4.4-1 and 5.3.5.4.4-2.

11. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

12. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3B-RF according to TS 36.508 [7] clause 7.2A.4. Cell 1 is the active cell.

13. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

14. Repeat steps 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.4.7.1 with the following exceptions.

Table 5.3.5.4.3-1: Common Exception messages for E-UTRAN TDD - HRPD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-8

Table 5.3.5.4.3-2: MeasObjectCDMA2000: Additional E-UTRAN TDD - HRPD handover

Derivation Path: 36.508, Table 4.6.6-1C			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectCDMA2000-GENERIC ::= SEQUENCE {			
cdma2000-Type	TypeHRPD		
carrierFreq SEQUENCE {			
bandClass	Band Class of frequency under test		
Arfcn	f14		
}			
searchWindowSize	8		
offsetFreq	db0		
cellsToRemoveList	Not present		
cellsToAddModList CHOICE {			
cellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE {			
cellIndex [1]	1		
physCellId [1]	PN offset of Cell 2		
cellIndex [2]	2		
physCellId [2]	PN offset of Cell 2 + 4		
cellIndex [3]	3		
physCellId [3]	PN offset of Cell 2 + 8		
cellIndex [4]	4		
physCellId [4]	PN offset of Cell 2 + 12		
cellIndex [5]	5		
physCellId [5]	PN offset of Cell 2 + 16		
cellIndex [6]	6		
physCellId [6]	PN offset of Cell 2 + 20		
cellIndex [7]	7		
physCellId [7]	PN offset of Cell 2 + 24		
cellIndex [8]	8		
physCellId [8]	PN offset of Cell 2 + 28		
}			
}			
cellForWhichToReportCGI	Not present		
}			

Table 5.3.5.4.3-3: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN TDD - HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	14 (-7 dB)	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.5.4.3-4: *MeasuredResults*: Additional E-UTRAN TDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.5.4.3-5: *MeasResultsCDMA2000*: Additional E-UTRAN TDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE {			
preRegistrationStatusHRPD	TRUE		
measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 2		
cgi-Info	Not present		
measResult SEQUENCE {			
pilotStrength		Set according to specific test	
}			
}			
}			

Table 5.3.5.4.3-6: *HandoverFromEUTRAPreparationRequest*

Derivation Path: 36.508 Table 4.6.1-4			
Information Element	**Value/remark**	**Comment**	**Condition**
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
handoverFromEUTRAPreparationRequest-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Rand	Not present		
mobilityParameters	Not present		
}			
}			
}			
}			

Table 5.3.5.4.3-7: *ULHandoverPreparationTransfer*

Derivation Path: 36.508 Table 4.6.1-24			
Information Element	**Value/remark**	**Comment**	**Condition**
ULHandoverPreparationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulHandoverPreparationTransfer-r8 SEQUENCE {			
cdma2000-Type	typeHRPD		
Meid	Not present		
dedicatedInfo	Set according to Table 5.3.5.4.3-8	HRPD Connection Request and Route Update	
}			
}			
}			
}			

Table 5.3.5.4.3-8: *dedicatedInfo* in *ULHandoverPreparationTransfer* (Table 5.3.5.4.3-7)

Information Element	Value/remark	Comment	Condition
SAPState	‘0’B	SAP Header	
SessionConfigurationToken	16 bits, Set by UE		
ConnectionLayerFormat	1 bit, Set by UE		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	‘0000’B		
Length	Length of *HRPD Route Update* message (Table 5.3.5.4.3-10) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header	
StreamHeader	‘00’B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the UE	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	‘00001110’	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Route Update.	
SessionLayerPacket	*HRPD Route Update* message (Table 5.3.5.4.3-10)		
Length	Length of *HRPD Connection Request* message (Table 5.3.5.4.3-9) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header	
StreamHeader	‘00’B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the UE	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	‘00001100’	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Idle State.	
SessionLayerPacket	*HRPD Connection Request* message (Table 5.3.5.4.3-9)		

Table 5.3.5.4.3-9: *HRPD Connection Request* (Table 5.3.5.4.3-8)

Information Element	Value/remark	Comment	Condition
MessageID	‘0000001’	Connection Request	
TransactionID	Any allowed value	8 bit field	
RequestReason	‘0000’	Access Terminal Initiated	

Table 5.3.5.4.3-10: *HRPD Route Update* (Table 5.3.5.4.3-8)

Information Element	Value/remark	Comment	Condition
MessageID	‘0000000’B	Route Update	
MessageSequence	8 bits, Set by UE		
ReferencePilotPN	9 bits, Set by UE		
ReferencePilotStrength	6 bits, Set by UE		
ReferenceKeep	‘1’B		
NumPilots	‘0000’B		
CompatibleReserved	‘0’B		
ReferencePilotChannelIncluded	‘1’B		
ReferencePilotChannel	24 bits, Set by UE		
ReferencePilotArrivalIncluded	‘1’B		
ReferencePilotArrival	15 bits, Set by UE		
Reserved	0-7 bits, Set all 0s by UE		

Table 5.3.5.4.3-11: *MobilityFromEUTRACommand* (step 9)

Derivation Path: 36.508, Table 4.6.1-6			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
mobilityFromEUTRACommand-r8 SEQUENCE {			
cs-FallbackIndicator	False		
purpose CHOICE{			
handover SEQUENCE {			
targetRAT-Type	cdma2000-HRPD		
targetRAT-MessageContainer	Set according to Table 5.3.5.4.3-12	HRPD Silence Parameters and HRPD Open Loop Parameters, HRPD Traffic Channel Assignment	
}			
}			
}			
}			
}			
}			

Table 5.3.5.4.3-12: *targetRAT-MessageContainer* in *MobilityFromEUTRACommand* (Table 5.3.5.4.3-11)

Information Element	Value/remark	Comment	Condition
SAPState	'1'B	SAP Header	
SessionConfigurationToken	'0'B		
ConnectionLayerFormat	1 bit, Set by SS		
ATI Record	34 bits, Set based on UATI assigned to UE		
Reserved	'0000'B		
Length	Length of *HRPD Silence Parameters* message (Table 5.3.5.4.3-14) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header (Note 1)	
StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the SS	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00001111'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Overhead Messages.	
SessionLayerPacket	*HRPD Silence Parameters* message (Table 5.3.5.4.3-14)	(Note 1)	
Length	Length of *HRPD Open Loop Parameters* message (Table 5.3.5.4.3-15) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header (Note 1)	
StreamHeader	'00'B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the SS	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	'00000100'	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Reverse Traffic Channel MAC.	
SessionLayerPacket	*HRPD Open Loop Parameters* message (Table 5.3.5.4.3-15)	(Note 1)	
Length	Length of *HRPD Traffic Channel Assignment* message (Table 5.3.5.4.3-13) + length of StreamHeader + length of SLPHeader + length of SNPHeader below, Set by SS	Connection Layer Header	

StreamHeader	‘00’B	Stream Layer header. Stream 0 is assigned to the Default Signalling Application	
SLPHeader	Set by the SS	Signalling Link Protocol SLP-D and SLP-F headers.	
SNPHeader	‘00001110’	Signalling Network Protocol header. InConfigurationProtocol=0, Type=Route Update.	
SessionLayerPacket	*HRPD Traffic Channel Assignment* message (Table 5.3.5.4.3-13)		

NOTE 1: *HRPD Silence Parameters* message and *HRPD Open Loop Parameters* message can be sent in any order.

Table 5.3.5.4.3-13: *HRPD Traffic Channel Assignment* (Table 5.3.5.4.3-12)

Information Element	Value/remark	Comment	Condition
MessageID	‘00000001’B	Traffic Channel Assignment	
MessageSequence	Set by SS	8 bit field	
ChannelIncluded	‘1’B	Channel record included	
Channel	‘000000000000000001111010’B	channel record for Cell 15	
FrameOffset	‘1010’B	frame offset for Cell 15	
DRCLength	‘01’B	DRCLength for Cell 15	
DRCChannelGainBase	‘111101’B	ratio of the power level of the DRC Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
ACKChannelGain	‘000110’B	ratio of the power level of the Ack Channel (when it is transmitted) to the power level of the Reverse Traffic Pilot Channel expressed as 2's complement value in units of 0.5 dB	
NumPilots	‘1’B		
PilotPN	‘000110010’B	PN Offset of target sector (Cell 15)	
SofterHandoff	‘0’B	Set to ‘0’since only 1 pilot included in message	
MACIndexLSBs	Set by SS	6 least significant bits of the MACIndex assigned to UE	
DRCCover	‘001’B	index of the DRC cover associated with target sector (Cell 15)	
RABLength	‘01’B	2 bit field	
RABOffset	‘010’B	3 bit field	

Table 5.3.5.4.3-14: *HRPD Silence Parameters* (Table 5.3.5.4.3-12)

Information Element	Value/remark	Comment	Condition
MessageID	‘00000010’B		
ReverseLinkSilenceDuration	2 bits, Set by SS		
ReverseLinkSilencePeriod	2 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

Table 5.3.5.4.3-15: *HRPD Open Loop Parameters* (Table 5.3.5.4.3-12)

Information Element	Value/remark	Comment	Condition
MessageID	'00000111'B		
NumPilots	'0001'B		
PilotPN	9 bits, Set by SS		
OpenLoopAdjust	8 bits, Set by SS		
InitialAdjust	5 bits, Set by SS		
PilotStrengthIncluded	1 bit, Set by SS		
PilotStrengthNominal	3 bits, Set by SS		
PilotStrengthCorrectionMin	3 bits, Set by SS		
PilotStrengthCorrectionMax	3 bits, Set by SS		
Reserved	0-7 bits, Set all 0s by SS		

5.3.5.5 Test requirement

Tables 5.3.5.4.1-1, 5.3.5.5-1 and 5.3.5.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - HRPD handover.

Table 5.3.5.5-1: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to HRPD cell # 2

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 KHz	-98.8	-98.8	-98.8
$\hat{E}_s/N_{oc}$	dB	-0.8	-0.8	-0.8
$\hat{E}_s/I_{ot}$	dB	-0.8	-0.8	-0.8
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.5.5-2: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	T3
Control $\frac{E_b}{N_t}$ (38.4 kbps)	dB	21		
Control $\frac{E_b}{N_t}$ (76.8 kbps)	dB	18		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0	0
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of HRPD chips (60) indicated by the search window for known target HRPD cells in the message

KC = 1; 1 known cell; HRPD cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target HRPD cells (0).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.6 E-UTRAN TDD - cdma2000 1xRTT handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

5.3.6.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bits 11 and 24.

5.3.6.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K is $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message

SW_O is $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC It is the number of known target cdma2000 1xRTT cells in the message, and

OC It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.6.

5.3.6.4 Test description

5.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.22.
2. The general test parameter settings are set up according to Table 5.3.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.6.4.3.
5. There is one E-UTRA TDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.6.4.1-1: General test parameters for E-UTRAN TDD to cdma2000 1xRTT handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4]Table 8.1.2.1-1 started before T2 starts
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (cdma2000 1X) measurement quantity			CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One cdma2000 1X carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		S	5	
T2		S	≤10	
T3		S	1	

5.3.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Tables 5.3.6.5-1 and 5.3.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 5.3.6.5-1 and 5.3.6.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event B2.

7. The SS transmits a *HandoverFromEUTRAPreparationRequest* on Cell 1.

8. The UE transmits tunnelled *1xRTT GCSNA Encapsulated Page Response* messages contained in an *ULHandoverPreparationTransfer* message on Cell 1.

9. The SS transmits a tunnelled *1xRTT GCSNA Encapsulated Handoff Direction* message contained in a *MobilityFromEUTRACommand* on Cell1 to order the UE to perform inter RAT to Cell 2.

10. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.6.5-1 and 5.3.6.5-2.

11. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

13. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

14. Repeat steps 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions.

Table 5.3.6.4.3-1: Common Exception messages for E-UTRAN TDD - cdma2000 1xRTT handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 5.3.6.4.3-2: *MeasConfig* (Table 5.3.6.4.3-1)

Derivation Path: 36.508, Table 4.6.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f17		
measObject[1]	MeasObjectCDMA2000-GENERIC		
measObjectId[2]	IdMeasObject-f1		
measObject[2]	MeasObjectEUTRA-GENERIC(f1)		
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-B2-CDMA2000		
reportConfig[1]	ReportConfigInterRAT-B2-CDMA2000(-90, -14)		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f17		
reportConfigId[1]	IdReportConfig-B2-CDMA2000		
}			
measGapConfig CHOICE {			
Setup SEQUENCE {			
gapOffset CHOICE {			
gp0	60		
}			
}			
}			
}			

Table 5.3.6.4.3-3: *MeasObjectCDMA2000*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: 36.508, Table 4.6.6-1C			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectCDMA2000-GENERIC ::= SEQUENCE {			
cdma2000-Type	type1XRTT		
carrierFreq SEQUENCE {			
bandClass	Band Class of frequency under test		
Arfcn	f14		
}			
searchWindowSize	8		
offsetFreq	db0		
cellsToRemoveList	Not present		
cellsToAddModList CHOICE {			
cellsToAddModListCDMA2000 ::= SEQUENCE (SIZE (1.. maxCellMeas)) OF SEQUENCE {			
cellIndex [1]	1		
physCellId [1]	PN offset of Cell 2		
cellIndex [2]	2		
physCellId [2]	PN offset of Cell 2 + 4		
cellIndex [3]	3		
physCellId [3]	PN offset of Cell 2 + 8		
cellIndex [4]	4		
physCellId [4]	PN offset of Cell 2 + 12		
cellIndex [5]	5		
physCellId [5]	PN offset of Cell 2 + 16		
cellIndex [6]	6		
physCellId [6]	PN offset of Cell 2 + 20		
cellIndex [7]	7		
physCellId [7]	PN offset of Cell 2 + 24		
cellIndex [8]	8		
physCellId [8]	PN offset of Cell 2 + 28		
}			
}			
cellForWhichToReportCGI	Not present		
}			

Table 5.3.6.4.3-4: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	28 (-14 dB)	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	1		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.6.4.3-5: *MeasuredResults*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.6.4.3-6: *MeasResultsCDMA2000*: Additional E-UTRAN TDD - cdma2000 1xRTT handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE {			
preRegistrationStatusHRPD	FALSE		
measResultListCDMA2000 ::=SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 2		
cgi-Info	Not present		
measResult SEQUENCE {			
pilotStrength		Set according to specific test	
}			
}			
}			

Table 5.3.6.4.3-7: *HandoverFromEUTRAPreparationRequest*

Derivation Path: 36.508 Table 4.6.1-4			
Information Element	**Value/remark**	**Comment**	**Condition**
HandoverFromEUTRAPreparationRequest ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
handoverFromEUTRAPreparationRequest-r8 SEQUENCE {			
cdma2000-Type	type1XRTT		
Rand	Set by SS	Random Challenge Data as broadcast on Cell 2	
mobilityParameters	Set according to 36.508 Table 4.5.2C.4-6	CDMA2000Parameters	
}			
}			
}			
}			

Table 5.3.6.4.3-8: *ULHandoverPreparationTransfer*

Derivation Path: 36.508 Table 4.6.1-24			
Information Element	**Value/remark**	**Comment**	**Condition**
ULHandoverPreparationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulHandoverPreparationTransfer-r8 SEQUENCE {			
cdma2000-Type	type1XRTT		
Meid	UE's meid		
dedicatedInfo	Set according to Table 5.3.6.4.3-8	1xRTT GCSNA Encapsulated Page Response message	
}			
}			
}			
}			

Table 5.3.6.4.3-9: *1xRTT GCSNA Encapsulated Page Response* (Table 5.3.6.4.3-7)

Information Element	Value/remark	Comment	Condition
MessageID	‘00000001’B	GCSNA1xCircuitService message	
GCSNAOption	‘00000001’B		
AlternativeGCSNAOption_INCL	‘0’B		
IWSIDIncl	‘0’B		
AckRequired	‘0’B		
StopDupDetect	‘0’B		
MessageSequence	6 bits, Set by UE		
NumTLACEncapsulated1xL3PDU	‘00’B		
Reserved	‘0000’B		
1xLogicalChannel	‘0’B		
1xProtocolRevision	‘00000110’B		
MsgType	‘00000101’B	Page Response message	
NumTLACHeaderRecords	‘0001’B		
TLACHeaderRecordType	‘0000’B		
TLACHeaderRecordLength	8 bits, Set by UE		
MSID_TYPE	3 bits, Set by UE	Should be matched with PREF_MSID_TYPE	
MSID_LEN	4 bits, Set by UE		
MSID	Variable, Set by UE		
Reserved	‘0000000’B		
1xL3PDULength	16 bits, Set by UE		
MOB_TERM	‘1’B		
SLOT_CYCLE_INDEX	’010’B		
MOB_P_REV	8 bits, Set by UE		
SCM	8 bits, Set by UE		
REQUEST_MODE	’001’B		
SERVICE_OPTION	16 bits, Set by UE		
PM	’0’B		
NAR_AN_CAP	’0’B		
ENCRYPTION_SUPPORTED	’0000’B		
NUM_ALT_SO	‘000’B		
UZID_INCL	’0’B		
CH_IND	’0’B		
OTD_SUPPORTED	’0000’B		
QPCH_SUPPORTED	’0’B		
ENHANCED_RC	’0’B		
FOR_RC_PREF	’0000’B		
REV_RC_PREF	’0’B		
FCH_SUPPORTED	’0’B		
FCH Capability Type-specific fields	Variable		
DCCH_SUPPORTED	’1’B		
REV_FCH_GATING_REQ	’0’B		

Table 5.3.6.4.3-10: *MobilityFromEUTRACommand*

Derivation Path: 36.508, Table 4.6.1-6			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE{			
mobilityFromEUTRACommand-r9 SEQUENCE {			
cs-FallbackIndicator	False		
purpose CHOICE{			
e-CSFB-r9 SEQUENCE {			
messageContCDMA2000-1XRTT-r9	Set according to Table 5.3.6.4.3-10	1xRTT GCSNA Encapsulated Handoff Direction message	
}			
}			
}			
}			
}			
}			

Table 5.3.6.4.3-11: *1xRTT GCSNA Encapsulated Handoff Direction* (Table5.3.6.4.3-9)

Information Element	Value/remark	Comment	Condition
MessageID	‘00000001’B		
GCSNAOption	‘00000001’B		
AlternativeGCSNAOption_INCL	‘0’B		
IWSIDIncl	‘0’B		
AckRequired	‘0’B		
StopDupDetect	‘0’B		
MessageSequence	Set by SS		
NumTLACEncapsulated1xL3PDU	‘00’B		
Reserved	‘0000’B		
1xLogicalChannel	‘1’B		
1xProtocolRevision	‘00000110’B		
MsgType	‘00100010’B	Universal Handoff Direction message	
NumTLACHeaderRecords	‘0000’B		
Reserved	‘000’B		
1xL3PDULength	16 bits, Set by SS		
USE_TIME	’0’B		
ACTION_TIME	’000000’B		
HDM_SEQ	2 bits, Set by SS		
PARMS_INCL	’1’B		
P_REV	‘00000110’B		
SERV_NEG_TYPE	’1’B		
SEARCH_INCLUDED	’1’B		
SRCH_WIN_A	’1000’B		
SRCH_WIN_N	’1001’B		
SRCH_WIN_R	’1011’B		
T_ADD	’010100’B		
T_DROP	’011110’B		
T_COMP	’1010’B		
T_TDROP	’0100’B		
SOFT_SLOPE	’000000’B		
ADD_INTERCEPT	’000000’B		
DROP_INTERCEPT	’000000’B		
EXTRA_PARMS	’1’B		
PACKET_ZONE_ID	’00000000’B		
FRAME_OFFSET	4 bits, Set by SS		
PRIVATE_LCM	’0’B		
RESET_L2	’1’B		
RESET_FPC	’1’B		
ENCRYPT_MODE	’00’B		
NOM_PWR_EXT	’0’B		
NOM_PWR	’0000’B		
RLGAIN_TRAFFIC_PILOT	’000000’B		
DEFAULT_RLAG	’1’B		
NUM_PREAMBLE	’000’B		
BAND_CLASS	5 bits, Set by SS		
CDMA_FREQ	11 bits, Set by SS		
RETURN_IF_HANDOFF_FAIL	’0’B		
PERIODIC_SEARCH	’0’B		
SCR_INCLUDED	’1’B		
NNSCR_INCLUDED	’1’B		
USE_PWR_CNTL_STEP	’0’B		
CLEAR_RETRY_DELAY	’0’B		
SCH_INCL	’1’B		
FPC_SUBCHAN_GAIN	’01010’B		
USE_PC_TIME	’0’B		
CH_IND	’101’B		
ACTIVE_SET_REC_LEN	8 bits, Set by SS		
NUM_PILOTS	’001’B		
SRCH_OFFSET_INCL	’1’B		
PILOT_PN	’000000000’B		
SRCH_OFFSET	’010’B		
ADD_PILOT_REC_INCL	’0’B		

PWR_COMB_IND	'0'B		
CODE_CHAN_FCH	11 bits, Set by SS		
QOF_MASK_ID_FCH	'00'B		
RESERVED	0-7 bits		
REV_FCH_GATING_MODE	'0'B		

5.3.6.5 Test requirement

Tables 5.3.6.4.1-1, 5.3.6.5-1 and 5.3.6.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - cdma2000 1xRTT handover test.

Table 5.3.6.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 KHz	-98+TT	-98+TT	-98+TT
$\hat{E}_s/N_{oc}$	dB	0+TT	0+TT	0+TT
$\hat{E}_s/I_{ot}$	dB	0+TT	0+TT	0+TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.6.5-2: Cell Specific Test requirement Parameters for Cell 2 cdma2000 1xRTT cell

Parameter	Unit	Cell 2 (cdma2000 1X)		
		T1	T2	T3
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16		
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0+TT	0+TT
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10+TT	-10+TT
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

SW_K = 1; $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips (60) indicated by the search window for known target cdma2000 1xRTT cells in the message

KC = 1; 1 known cell; cdma2000 1xRTT cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target cdma2000 1xRTT cells (0).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6 RRC Connection Mobility Control

When the UE is in RRC_CONNECTED, for which security has been activated, initiate the RRC re-establishment procedure in order to continue the RRC connection, the RRC re-establishment process takes place. In this process the UE initiates the procedure when one of the following conditions is met: upon re-entry of the service area after having detected radio link failure, upon handover failure or when lower layers detect problems as defined in TS 36.331 [5] clause 5.3.7.2. After selecting the best cell the UE send a 'RRC Connection Re-establishment Request message' to the System Simulator as defined in TS 36.331 [5] clause 5.3.7. The connection re-establishment succeeds only if the concerned cell is prepared i.e. has a valid UE context within the specified UE re-establishment delay period.

When the random access procedure is initiated by a PDCCH order or by the MAC sublayer itself, the random access process takes place. This process allows the PDCCH order or RRC optionally to indicate a random access preamble and PRACH resource as defined in TS 36.321 [11] clause 5.1. In this process from the physical layer perspective, the L1 random access procedure encompasses the transmission of random access preamble and random access response as defined in TS 36.213 [8] clause 6.1. The random access procedure is used when establishing the L1 communication between the UE and E-UTRAN.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3. This applies only for Re-establishment tests (subclause 6.1).

6.1 RRC Re-establishment

6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment

6.1.1.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.1.1.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}esta}blish\_delay = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq*Tsearch + TSI + TPRACH$$

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.1.

6.1.1.4 Test description

6.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20.
2. The parameter settings for the cells are set up according to Table 6.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.1.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.1.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.1.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.1.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.1.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.1.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.1.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.1.5 Test requirement

Table 6.1.1.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.1.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 1

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment

6.1.2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 25.

6.1.2.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

TUE-re-establish_delay = 50 ms + Nfreq*Tsearch + TSI + TPRACH

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.2.

6.1.2.4 Test description

6.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The parameter settings for the cells are set up according to Table 6.1.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.1.2.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.2.4.1-1: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA FDD inter-frequency carrier list size			1	2 E-UTRA FDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		ms	200	
T3		s	5	

6.1.2.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.2.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.2.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 3 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.2.4.3-1: Common Exception messages for E-UTRAN FDD Inter-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.2.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE OF {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

6.1.2.5 Test requirement

Table 6.1.2.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Inter-frequency RRC Re-establishment test case.

Table 6.1.2.5-1: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
BW$_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA FDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 2

T_{search} = 800 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, within the allowance of 3 s in the test case.

6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment

6.1.3.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.1.3.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$TUE\text{-}re\text{-}establish\_delay = 50\ ms + Nfreq*Tsearch + TSI + T_{PRACH}$$

T_{search} is the time required by the UE to search the target cell.

T_{search} is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} is the additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq} is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.3.

6.1.3.4 Test description

6.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20.
2. The parameter settings for the cells are set up according to Table 6.1.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.3.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.3.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.3.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.3.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.3.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 within 1.5 s from the beginning of time period T3. then the number of successful tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.3.4.3-1: Common Exception messages for E-UTRAN intra frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.3.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.3.5 Test requirement

Table 6.1.3.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.3.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE\_re\text{-}establish\_delay} = 50\text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$N_{freq} = 1$

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment

6.1.4.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 25.

6.1.4.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$\text{TUE-re-establish\_delay} = 50\text{ ms} + \text{Nfreq*Tsearch} + \text{TSI} + T_{PRACH}$$

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.4.

6.1.4.4 Test description

6.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The parameter settings for the cells are set up according to Table 6.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.4.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.4.4.1-1: General test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA TDD inter-frequency carrier list size			1	2 E-UTRA TDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		ms	200	
T3		s	5	

6.1.4.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.3.5-1. T2 starts.
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.3.5-1. T3 starts.
7. If the UE starts to send PRACH preambles to cell 2 within 3s from the beginning of time period T3. then the number of successful tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.4.4.3-1: Common Exception messages for E-UTRAN inter frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.4.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE OF {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedDependentParameters	Not present		
}			

6.1.4.5 Test requirement

Table 6.1.4.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Inter-frequency RRC Re-establishment test case.

Table 6.1.4.5-1: Cell specific test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in A.2.1 (OP.1 TDD) and in A.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA TDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + T_{SI} + T_{PRACH}

N_{freq} = 2

T_{search} = 800 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, within the allowance of 3 s in the test case.

6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth

6.1.5.1 Test purpose

Same test purpose as clause 6.1.1.1.

6.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31.

6.1.5.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.1.1.3 with the following exceptions:

- Instead of A.6.1.1 → use A.6.1.5.

6.1.5.4 Test description

6.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20.
2. The parameter settings for the cells are set up according to Table 6.1.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.5.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.5.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 6.1.1.4.1-1 for the other parameters. Note 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

6.1.5.4.2 Test procedure

Same test procedure as in clause 6.1.1.4.2 with the following exceptions:

- Instead of Table 6.1.1.5-1 → use Table 6.1.5.5-1.

6.1.5.4.3 Message contents

Same message contents as defined in clause 6.1.1.4.3.

6.1.5.5 Test requirement

Same test requirement as in clause 6.1.1.5 with the following exceptions:

Table 6.1.5.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.5.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case for 5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	5			5		
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)		OP.15 FDD	OP.15 FDD	OP.16 FDD	OP.16 FDD	OP.16 FDD	OP.15 FDD
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table 6.1.1.5-1 for the other parameters.							

6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0

6.1.6.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.6.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward of UE category 0.

6.1.6.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}esta}\text{blish\_delay} = \text{TUL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$\text{TUE-re-establish\_delay} = 50 \text{ ms} + \text{Nfreq*Tsearch} + \text{TSI} + \text{TPRACH}$$

T_{search} = It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

$T_{searc\mathit{h}}$ = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.6.

6.1.6.4 Test description

6.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.6.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.6.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.6.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.6.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.6.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.6.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.6.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.6.5 Test requirement

Table 6.1.6.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.6.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2(OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 1

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0

6.1.7.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.7.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0.

6.1.7.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

TUE-re-establish_delay = 50 ms + Nfreq*Tsearch + TSI + TPRACH

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.7.

6.1.7.4 Test description

6.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).

2. The parameter settings for the cells are set up according to Table 6.1.7.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.1.7.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.7.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.2.3
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.7.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.7.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.7.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.7.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.7.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.7.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN FDD intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.7.5 Test requirement

Table 6.1.7.5-1 defines the primary level settings including test tolerances for E-UTRAN HD-FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.7.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1(OP.1 FDD) and in D.1.2(OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 1

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0

6.1.8.1 Test purpose

To verify that the category 0 UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.8.2 Test applicability

This test applies to all type of E-UTRA TDD UE release 12 and forward of UE category 0.

6.1.8.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target PCell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends PRACH to the target PCell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq}{*}Tsearch + T_{SI} + T_{PRACH}$$

- T_{search}: It is the time required by the UE to search the target PCell.

  T_{search} = It is 100 ms if the target PCell is known by the UE; the target PCell is known if it has been measured by the UE in the last 5 seconds.

  T_{search} = It is 800 ms if the target PCell is unknown by the UE; the target PCell is unknown if it has not been measured by the UE in the last 5 seconds.

  T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target PCell.

  T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

  N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target PCell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.8.

6.1.8.4 Test description

6.1.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 using only main UE Tx/Rx antenna.

2. The parameter settings for the cells are set up according to Table 6.1.8.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.1.8.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.8.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.12 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		μs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.8.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.8.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.8.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.8.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 within 1.5 s from the beginning of time period T3. then the number of successful tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.8.4.3-1: Common Exception messages for E-UTRAN intra frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.8.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.8.5 Test requirement

Table 6.1.8.5-1 and Table 6.1.8.4.1-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.8.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + T_{SI} + T_{PRACH}

N_{freq} = 1

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

6.1.9.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.9.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1.

6.1.9.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = TUL\_grant + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [5] is detected by the UE to the moment the UE has transmitted all repetitions of the PRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement for a UE configured with CEModeA shall be less than:$T_{UE\text{-}re\text{-}establish\_delay}$ = 50 ms + N_{freq}*Tsearch + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ + T_{PRACH}

- T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 for a UE configured with CEModeA.

  In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

- T_{SI}: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA. $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

- T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

- N_{freq}: It is the total number of frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.9.

6.1.9.4 Test description

6.1.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.9.4.1-1: General test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.9.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.9.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.9.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.9.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 6.1.9.4.3-1: Common Exception messages for E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.9.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency FD-FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.9.5 Test requirement

Table 6.1.9.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.9.5-1: Cell specific test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH parameters		DL Reference Measurement Channel R.21 FDD			As specified in clause A.8.1		
MPDCCH parameters		DL Reference Measurement Channel R.17 FDD			As specified in clause A.7.1		
OCNG Patterns defined in D.1.21 (OP.21 FDD) and in D.1.2 (OP.2 FDD)		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ + T_{PRACH}

N_{freq} = 1

T_{search} = 0 ms

$T_{SI-EUTRA-M1-CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, within the allowance of 1.5 s in the test case.

6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

6.1.10.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.10.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1.

6.1.10.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re-establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re-establish\_delay}$) shall be less than:

$$T_{re-establish\_delay} = T_{UL\_grant} + T_{UE\_re-establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re-establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [5] is detected by the UE to the moment the UE has transmitted all repetitions of the PRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re-establish\_delay}$) requirement for a UE configured with CEModeA shall be less than:

$$T_{UE-re-establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI-EUTRA-M1-CEModeA} + T_{PRACH}$$

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 for a UE configured with CEModeA.

In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

- T_{SI}: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA. $T_{SI-EUTRA-M1-CEModeA}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.
- T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.
- N_{freq}: It is the total number of frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.10.

6.1.10.4 Test description

6.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.10.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.10.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.10.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.10.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.10.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.10.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 6.1.10.4.3-1: Common Exception messages for E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.10.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN HD-FDD intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.10.5 Test requirement

Table 6.1.10.5-1 defines the primary level settings including test tolerances for E-UTRAN HD-FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.10.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH parameters		DL Reference Measurement Channel R.11 HD-FDD			As specified in clause A.8.2		
MPDCCH parameters		DL Reference Measurement Channel R.7 HD-FDD			As specified in clause A.7.2		
OCNG Patterns defined in D.1.21 (OP.21 FDD) and in D.1.2 (OP.2 FDD)		OP.21 FDD	OP.21 FDD	OP.6 FDD	OP.6 FDD	OP.6 FDD	OP.21 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ + T_{PRACH}

N_{freq} = 1

T_{search} = 0 ms

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, within the allowance of 1.5 s in the test case.

6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

6.1.11.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.11.2 Test applicability

This test applies to all type of E-UTRA TDD UE release 13 and forward of UE category M1.

6.1.11.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target PCell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [5] is detected by the UE to the moment the UE has transmitted all repetitions of the PRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement for a UE configured with CEModeA shall be less than:$T_{UE\text{-}re\text{-}establish\_delay}$ = 50 ms + N_{freq}*Tsearch + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ + T_{PRACH}

- T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 for a UE configured with CEModeA.

  In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

- T_{SI}: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA. $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

- T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

- N_{freq}: It is the total number of frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.11.

6.1.11.4 Test description

6.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 (using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.11.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.11.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.11.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_2CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.11.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. 10. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.11.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. SS shall transmit an *RRCConnectionReconfiguration* message.
4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.11.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.11.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 6 with the condition CEModeA with the following exceptions:

Table 6.1.11.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency RRC Re-establishment requirement for Cat-M1 UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.11.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.11.5 Test requirement

Table 6.1.11.5-1 and Table 6.1.11.4.1-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.11.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
PDSCH parameters		DL Reference Measurement Channel R.17 TDD			As specified in clause A.8.3		
MPDCCH parameters		DL Reference Measurement Channel R.15 TDD			As specified in clause A.7.3		
OCNG Patterns defined in D.2.11 (OP.11 TDD) and in D.2.2 (OP.2 TDD)		OP.11 TDD	OP.11 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.11 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
MPDCCH_RA	dB						
MPDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Antenna Configuration		2x1			2x1		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeA}$ + T_{PRACH}

N_{freq} = 1

T_{search} = 0 ms

$T_{SI-EUTRA-M1-CEModeA}$ = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1345 ms, allow 1.5 s in the test case.

6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The test procedure to have UE in CEMode A during T1 and CEmodeB at re-establishment in T3 is pending discussion in RAN4*.

6.1.12.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 that supports CEModeB.

6.1.12.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re-establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re-establish\_delay}$) shall be less than:

$$T_{re-establish\_delay} = T_{UL\_grant} + T_{UE\_re-establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re-establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re-establish\_delay}$) requirement shall be less than:

$$T_{UE-re-establish\_delay} = 50 \text{ ms} + N_{freq}*Tsearch + T_{SI-EUTRA-M1-CEModeB} + T_{PRACH}$$

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 in TS 36.331 [5] for a UE configured with CEModeA or as described in Clause 8.13.3.1 in TS 36.331 [5] for a UE configured with CEModeB.

In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

$T_{SI-EUTRA-M1-CEModeB}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA; $T_{SI-EUTRA-M1-CEModeB}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

Nfreq: It is the total number of frequencies to be monitored for RRC re-establishment; Nfreq = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2.1 and A.6.1.12.

6.1.12.4 Test description

6.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.12.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.12.4.1-1: General test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_3CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		s	5	
T3		ms	4000	
T4		s	9	

6.1.12.4.2 Test procedure

The test consists of 4 successive time periods, with time duration of T1, T2, T3 and T4 respectively. At the start of time period T3, cell 1, which is the active cell, is deactivated. The time period T4 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.12.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.12.5-1. T2 starts

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.12.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 7 s from the beginning of time period T4, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. After T4 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 6.1.12.4.3-1: Common Exception messages for E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.12.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency FD-FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.12.5 Test requirement

Table 6.1.12.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.12.5-1: Cell specific test parameters for E-UTRAN FD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB test case

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				1			
$BW_{channel}$	MHz	10				10			
PDSCH parameters		DL Reference Measurement Channel R.23 FDD							
MPDCCH parameters		DL Reference Measurement Channel R.19 FDD							
OCNG Patterns defined in D.1.21 (OP.21 FDD) and in D.1.2 (OP.2 FDD)		OP.21 FDD	OP.21 FDD	OP.21 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.21 FDD
PBCH_RA	dB	-3				-3			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PHICH_RA	dB								
PHICH_RB	dB								
MPDCCH_RA	dB								
MPDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
$\hat{E}_s/I_{ot}$	dB	1.54	-12.14	-Infinity	-Infinity	-3.79	-12.14	-12	-12
N_{oc} Note 2	dBm/15 KHz	-98							
$\hat{E}_s/N_{oc}$	dB	7	-14.4	-Infinity	-Infinity	4	-12	-12	-12
RSRP Note 3	dBm/15 KHz	-91	-112.4	-Infinity	-Infinity	-94	-110	-110	-110
Propagation Condition		AWGN							
Antenna Configuration		2x1				2x1			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.									

The RRC re-establishment delay is defined as the time from the start of time period T4, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 7 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ + T_{PRACH}

N_{freq} = 1

T_{search} = 0 ms

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ = 6400 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 6485 ms, within the allowance of 7 s in the test case.

6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The test procedure to have UE in CEMode A during T1 and CEmodeB at re-establishment in T3 is pending discussion in RAN4.

6.1.13.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.13.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that supports CEModeB.

6.1.13.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay} = 50\text{ ms} + N_{freq}{*}Tsearch + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB} + T_{PRACH}$$

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 in TS 36.331 [5] for a UE configured with CEModeA or as described in Clause 8.13.3.1 in TS 36.331 [5] for a UE configured with CEModeB.

In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA; $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

Nfreq: It is the total number of frequencies to be monitored for RRC re-establishment; Nfreq = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2 and A.6.1.13.

6.1.13.4 Test description

6.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.13.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.13.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.13.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_3CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		s	5	
T2		s	5	
T3		ms	4000	
T4		s	9	

6.1.13.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2, T3 and T4 respectively. At the start of time period T3, cell 1, which is the active cell, is deactivated. The time period T4 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.13.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.13.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.13.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 7 s from the beginning of time period T4, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T4 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 6.1.13.4.3-1: Common Exception messages for E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.13.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency HD-FDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.13.5 Test requirement

Table 6.1.13.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.13.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB test case

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				1			
$BW_{channel}$	MHz	10				10			
PDSCH parameters		DL Reference Measurement Channel R.13 FDD							
MPDCCH parameters		DL Reference Measurement Channel R. 9 FDD							
OCNG Patterns defined in D1.21 (OP.21 FDD) and in D.1.2 (OP.2 FDD)		OP.21 FDD	OP.21 FDD	OP.21 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.21 FDD
PBCH_RA	dB	-3				-3			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PHICH_RA	dB								
PHICH_RB	dB								
MPDCCH_RA	dB								
MPDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
$\hat{E}_s/I_{ot}$	dB	1.54	-15.27	-Infinity	-Infinity	-3.79	-12.14	-12	-12
N_{oc} Note 2	dBm/15 KHz	-98							
$\hat{E}_s/N_{oc}$	dB	7	-14.4	-Infinity	-Infinity	4	-12	-12	-12
RSRP Note 3	dBm/15 KHz	-91	-113	-Infinity	-Infinity	-94	-110	-110	-110
Propagation Condition		AWGN							
Antenna Configuration		2x1				2x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 7 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + N_{freq}* T_{search} + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ + T_{PRACH}

N_{freq} = 1

T_{search} = 0 ms

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ = 6400 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 6485 ms, within the allowance of 7 s in the test case.

6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The test procedure to have UE in CEMode A during T1 and CEmodeB at re-establishment in T3 is pending discussion in RAN4.

6.1.14.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 that supports CEModeB.

6.1.14.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay} = 50 \text{ ms} + N_{freq}{*}Tsearch + T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB} + T_{PRACH}$$

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times. Otherwise, T_{search} is the time duration required for the cell identification is specified in relevant intra-frequency cell identification requirements as described in Clause 8.13.2.1 in TS 36.331 [5] for a UE configured with CEModeA or as described in Clause 8.13.3.1 in TS 36.331 [5] for a UE configured with CEModeB.

In the above requirement, a cell is known if it has been meeting the relevant cell identification requirement for a time duration equal to or longer than the time duration required for the cell identification. Otherwise, it is unknown.

$T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for the target cell for a UE configured with CEModeA; $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ includes the time to acquire the MIB and all the relevant SIBs of the target cell.

T_{PRACH} is the interruption uncertainty in acquiring the first available PRACH occasion in the target cell. The actual value of T_{PRACH} shall depend upon the PRACH configuration used in the target cell and the PRACH coverage enhancement level used by the UE for sending the random access to the target cell.

Nfreq: It is the total number of frequencies to be monitored for RRC re-establishment; Nfreq = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.7.2 and A.6.1.14.

6.1.14.4 Test description

6.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The parameter settings for the cells are set up according to Table 6.1.14.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.14.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.14.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value	Comment
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
PRACH Configuration			PRACH_3CE	As specified in A.9
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		μs	3	Synchronous cells
T1		s	5	
T2		s	5	
T2		ms	4000	
T3		s	9	

6.1.14.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2, T3 and T4 respectively. At the start of time period T3, cell 1, which is the active cell, is deactivated. The time period T4 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.14.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.14.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.14.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 7 s from the beginning of time period T4, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T4 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 6.1.14.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.14.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency TDD RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
speedDependentParameters	Not present		
}			

6.1.14.5 Test requirement

Table 6.1.14.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.14.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB test case

Parameter	Unit	Cell 1				Cell 2			
		T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				1			
$BW_{channel}$	MHz	10				10			
PDSCH parameters		DL Reference Measurement Channel R.19 TDD							
MPDCCH parameters		DL Reference Measurement Channel R.17 TDD							
OCNG Patterns defined in D.2.11 (OP.11 TDD) and in D.2.2 (OP.2 TDD)		OP.11 TDD	OP.11 TDD	OP.11 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2TDD	OP.11 TDD
PBCH_RA	dB	0				0			
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB								
PHICH_RA	dB								
PHICH_RB	dB								
MPDCCH_RA	dB								
MPDCCH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA Note 1	dB								
OCNG_RB Note 1	dB								
$\hat{E}_s/I_{ot}$	dB	1.54	-15.27	-Infinity	-Infinity	-3.79	-12.14	-12	-12
N_{oc} Note 2	dBm/15 KHz	-98							
$\hat{E}_s/N_{oc}$	dB	7	-14.4	-Infinity	-Infinity	4	-12	-12	-12
RSRP Note 3	dBm/15 KHz	-91	-113	-Infinity	-Infinity	-94	-110	-110	-110
Propagation Condition		AWGN							
Antenna Configuration		2x1				2x1			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 7 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + $T_{SI\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ + T_{PRACH}

N_{freq} = 1

T_{search} = 0 ms

$T_{SI\ I\text{-}EUTRA\text{-}M1\text{-}CEModeB}$ = 6400 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 6485 ms, within the allowance of 7 s in the test case.

6.1.15 HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage

Editor's notes: This clause is incomplete, the following items are TBD

- Test system uncertainty and tolerance is undefined.
- Connection diagram is TBD.
- Test procedure is incomplete.
- Test requirement of TS36.133 included TBD and bracket.

6.1.15.1 Test purpose

The purpose is to verify that the NB-IoT FDD intra-frequency RRC re-establishment delay is within the specified limits from the moment it detects a loss in RRC connection.

6.1.15.2 Test applicability

This test case applies to all types of UE release 13 and forward of UE category NB1. Applicability requires support for User Plane CIoT EPS optimization.

6.1.15.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay\_NB\text{-}IoT}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay\_NB\text{-}IoT}$) shall be less than:

$$T_{re\text{-}establish\_delay\_NB\text{-}IoT} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends NPRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\text{ ms} + N_{NB\text{-}Iot\text{-}freq}{*}Tsearch\_NB\text{-}IoT + T_{SI\_NB\text{-}IoT} + T_{NPRACH\_NB\text{-}IoT}$$

$T_{search\_NB\text{-}IoT}$: It is the time required by the UE to search the target cell:

If the target cell is known, then T_{search} = 0 ms. then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} = [1400] ms if $Q \geq -6$dB or, T_{search} = [14800] ms if $-15\text{dB} \leq Q < -6$dB.

Note: Q is the NSCH Ês/Iot of target cell. A cell is unknown if it has not been measured by the UE in the last 5 seconds. Otherwise it is known.

$T_{SI\_NB\text{-}IoT}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target cell.

T_{NPRACH_NB-IoT}: The additional delay caused by the random access procedure; the actual value of T_{PRACH_NB-IoT} shall depend upon the NPRACH configuration used in the target cell and the number of repetition used by UE for sending random access to the target cell. There might be additional delay due to ramping procedure;

$N_{NB-Iot-freq}$: It is the total number of NB-IoT frequencies to be monitored for RRC re-establishment; $N_{NB-Iot-freq} = 1$ if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.5 and A.6.1.15.

6.1.15.4 Test description

6.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table Annex E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2..

Channel Bandwidth to be tested: As specified in Table 6.1.15.5-1 and 6.1.15.5-2.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure [TBD].
2. The parameter settings for the cells are set up according to Table 6.1.15.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.15.4.3.
5. There is one NB-IoT carrier and one E-UTRA FDD carrier and three cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. Ncell 1 and Ncell 2 are NB-IoT cells with different physical cell ID on the same frequency carrier.

Table 6.1.15.4.1-1: General test parameters for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 in In-Band mode under normal coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Ncell2	
Final condition	Active cell		Ncell2	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
NPRACH Configuration			1	Refer to Table A.10.3-1
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	10000	RRC re-establishment timer
DRX			OFF	
T1		s	5	
T2		ms	[800]	
T3		s	[11]	

6.1.15.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, Ncell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.15.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.15.5-1. T2 starts.
4. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.15.5-1. T3 starts.
5. If the UE starts to send NPRACH preambles to Ncell 2 for sending the *RRCConnectionReestablishmentRequest-NB* message to Ncell 2 within [TBD ms] from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. After T3 expires, switch off the UE. Then ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.
7. Repeat step 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6.

6.1.15.5 Test requirement

Table 6.1.15.5-1 and Table 6.1.15.5-2 defines the primary level settings including test tolerances for HD-FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.15.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	200			200		
PRB location within Cell	-	30			30		
NPDSCH parameters defined in clause A.10.2		R.14 HD-FDD			R.14 HD-FDD		
NPDCCH parameters defined in clause A.10.1		R.26 HD-FDD			R.26 HD-FDD		
NOCNG Patterns defined in clause D.3	-	NOP.1 FDD			NOP.1 FDD		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
N_{oc}	dBm/15 kHz	Specified in Table 6.1.15.5-2					
$\hat{E}_s/N_{oc}$	dB	7+TT	-Infinity	-Infinity	4+TT	4+TT	4+TT
$\hat{E}_s/I_{ot}$ Note2	dB	1.54+TT	-Infinity	-Infinity	-3.79+TT	4+TT	4+TT
NRSRP Note2	dBm/15 kHz	-91+TT	-Infinity	-Infinity	-94+TT	-94+TT	-94+TT
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Ncell 1	ms	-			3		
Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 6.1.15.5-2: Cell 1 specific test parameters for HD-FDD Intra-frequency RRC Re-establishment for category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Cell 1		
		T1	T2	T3
$BW_{channel}$	MHz	10		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
[PCFICH_RB]	dB			
[PDCCH_RA]	dB			
[PDCCH_RB]	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	4+TT
$\hat{E}_s/I_{ot}$ Note2	dB	4+TT	4+TT	4+TT
RSRP Note2	dBm/15 kHz	-94+TT	-94+TT	-94+TT
Propagation Condition		AWGN		
Antenna Configuration		1x1		
Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}. Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to Ncell 2 for sending the *RRCConnectionReestablishmentRequest-NB* message to Ncell 2.

The RRC re-establishment delay to a unknown NB-IoT FDD intra frequency cell shall be less than TBD s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}$ = 100 ms + $N_{NB\text{-}Iot\text{-}freq}$*$T_{search\_NB\text{-}IoT}$ + $T_{SI\_NB\text{-}IoT}$ + $T_{NPRACH\_NB\text{-}IoT}$

$N_{NB\text{-}Iot\text{-}freq}$ = 1

$T_{search\_NB\text{-}IoT}$ = [1400] ms

$T_{SI\_NB\text{-}IoT}$ = [8320] ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

$T_{NPRACH\_NB\text{-}IoT}$ = [80] ms; it is the additional delay caused by the random access procedure.

6.1.16 HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Editor's notes: This clause is incomplete, the following items are TBD

- Test system uncertainty and tolerance is TBD
- Connection diagram is TBD
- Test requirement and procedure still bracket.

6.1.16.1 Test purpose

The purpose is to verify that the NB-IoT FDD inter-frequency RRC re-establishment delay is within the specified limits from the moment it detects a loss in RRC connection.

6.1.16.2 Test applicability

This test case applies to all types of UE release 13 and forward of UE category NB1. Applicability requires support for user plane CIoT EPS optimization.

6.1.16.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay\_NB\text{-}IoT}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay\_NB\text{-}IoT}$) shall be less than:

$$T_{re\text{-}establish\_delay\_NB\text{-}IoT} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in clause 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends NPRACH preamble to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay\_NB\text{-}IoT}$) requirement shall be less than:

$$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT} = 100\text{ ms} + N_{NB\text{-}Iot\text{-}freq} * \text{Tsearch\_NB-IoT} + T_{SI\_NB\text{-}IoT} + T_{NPRACH\_NB\text{-}IoT}$$

$T_{search\_NB\text{-}IoT}$: It is the time required by the UE to search the target cell:

If the target cell is known, then T_{search} = 0 ms. then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Otherwise, T_{search} = [1400] ms if Q ≥ -6dB or, T_{search} = [14800] ms if -15dB ≤ Q < -6dB.

Note: Q is the NSCH Ês/Iot of target cell. A cell is unknown if it has not been measured by the UE in the last 5 seconds. Otherwise it is known.

$T_{SI\_NB\text{-}IoT}$: It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for the target cell.

$T_{NPRACH\_NB\text{-}IoT}$: The additional delay caused by the random access procedure; the actual value of $T_{PRACH\_NB\text{-}IoT}$ shall depend upon the NPRACH configuration used in the target cell and the number of repetition used by UE for sending random access to the target cell. There might be additional delay due to ramping procedure;

$N_{NB\text{-}Iot\text{-}freq}$: It is the total number of NB-IoT frequencies to be monitored for RRC re-establishment; $N_{NB\text{-}Iot\text{-}freq}$ = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.5 and A.6.1.16.

6.1.16.4 Test description

6.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: As specified in Table 6.1.16.5-1 and 6.1.16.5-2.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure [TBD].
2. The parameter settings for the cells are set up according to Table 6.1.16.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.16.4.3.
5. There is one NB-IoT carrier and one E-UTRA FDD carrier and three cells specified in the test. Ncell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test. Ncell1 and Ncell2 are NB-IoT cells on different frequency carriers.

Table 6.1.16.4.1-1: General test parameters for HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Parameter		Unit	Value	Comment
NB-IOT operational mode			In-band	
Initial condition	Active cell		Ncell1	
	Neighbour cells		Cell1, Ncell2	
Final condition	Active cell		Ncell2	
E-UTRA RF Channel Number			1	One carrier frequency is used for Cell.
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
NPRACH Configuration			1	Refer to Table A.10.3-1
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	100000	RRC re-establishment timer
DRX			OFF	
T1		s	5	
T2		ms	[8000]	
T3		s	[100]	

6.1.16.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, Ncell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.16.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.16.5-1. T2 starts

4. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.16.5-1. T3 starts

5. If the UE starts to send NPRACH preambles to Ncell2 for sending the*RRCConnectionReestablishmentRequest-NB* message to Ncell 2 within [73 ms] from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. After T3 expires, cause UE handover back to Ncell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 2A-NB with UP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5. Ncell 1 is the active cell.

7. Repeat step 2-6 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6.

6.1.16.5 Test requirement

Table 6.1.16.5-1 and 6.1.16.5-2 defines the primary level settings including test tolerances for HD- FDD Inter-frequency RRC Re-establishment test case.

Table 6.1.16.5-1: Ncell 1, Ncell 2 specific test parameters for HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Ncell 1			Ncell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	kHz	200			200		
PRB location within Cell	-	[30]			[35]		
NPDSCH parameters defined in clause A.10.2		R.14 HD-FDD			R.14 HD-FDD		
NPDCCH parameters defined in clause A.10.1		R.26 HD-FDD			R.26 HD-FDD		
NOCNG Patterns defined in clause D.3	-	NOP.1 FDD			NOP.1 FDD		
NPBCH_RA	dB	0			0		
NPBCH_RB	dB						
NPSS_RA	dB						
NSSS_RA	dB						
NPDCCH_RA	dB						
NPDCCH_RB	dB						
NPDSCH_RA	dB						
NPDSCH_RB	dB						
NOCNG_RA Note 1	dB						
NOCNG_RB Note 1	dB						
N_{oc}	dBm/15 kHz	Specified in Table A.6.1.16.1-3					
$\hat{E}_s/N_{oc}$	dB	7+TT	-Infinity	-Infinity	-Infinity	-12.6+TT	-12.6+TT
$\hat{E}_s/I_{ot}$ Note2	dB	1.54+TT	-Infinity	-Infinity	-Infinity	-12.6+TT	-12.6+TT
NRSRP Note2	dBm/15 kHz	-91+TT	-Infinity	-Infinity	-Infinity	-110.6+TT	-110.6+TT
Propagation Condition		AWGN			AWGN		
Antenna Configuration		1x1			1x1		
Timing offset to Ncell 1	ms	-			3		
Note 1: NOCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Es/Iot and NRSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 6.1.16.5-2: Cell 1 specific test parameters for HD-FDD Inter-frequency RRC Re-establishment for category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Cell 1		
		T1	T2	T3
$BW_{channel}$	MHz	10		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
[PCFICH_RB]	dB			
[PDCCH_RA]	dB			
[PDCCH_RB]	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	[-98]+TT		
$\hat{E}_s/N_{oc}$	dB	[-12.6] +TT	[-12.6] +TT	[-12.6] +TT
$\hat{E}_s/I_{ot}$ Note2	dB	[-12.6] +TT	[-12.6] +TT	[-12.6] +TT
RSRP Note2	dBm/15 kHz	[-110.6] +TT	[-110.6] +TT	[-110.6] +TT
Propagation Condition		AWGN		
Antenna Configuration		1x1		
Note 1: OCNG shall be used such that the Cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}. Note 3: Es/Iot and RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send NPRACH preambles to Ncell 2 for sending the *RRCConnectionReestablishmentRequest-NB* message to Ncell 2.

The RRC re-establishment delay to a unknown NB-IoT FDD inter frequency cell shall be less than 73 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The NPRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\text{-}re\text{-}establish\_delay\_NB\text{-}IoT}$ = 100 ms + $N_{NB\text{-}Iot\text{-}freq}$*$T_{search\_NB\text{-}IoT}$ + $T_{SI\_NB\text{-}IoT}$ + $T_{NPRACH\_NB\text{-}IoT}$

$N_{NB\text{-}Iot\text{-}freq}$ = 2

$T_{search\_NB\text{-}IoT}$ = [14800] ms

$T_{SI\_NB\text{-}IoT}$ = [41560] ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 for the target NB-IoT FDD cell.

$T_{NPRACH\_NB\text{-}IoT}$ = [1280] ms; it is the additional delay caused by the random access procedure.

6.2 Random Access

6.2.1 E-UTRAN FDD - Contention Based Random Access Test

6.2.1.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.2.1.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1 and A.6.2.1.

6.2.1.4 Test description

6.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.1.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to Tables 6.2.1.5-1 and 6.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response reception

   4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4. The UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.1.5-3 and 6.2.1.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.1.5-4 and 6.2.1.5-5.

5. Test 2: Correct behaviour when not receiving random access response reception

   5.1. Repeat step 1-3.

   5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

   5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 10 sub-frames.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The UE shall consider this random access response reception successful and transmit the msg3.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.1.5-3 and 6.2.1.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.1.5-4 and 6.2.1.5-5.

6. Test 3: Correct behaviour when receiving a NACK on msg3

   6.1. Repeat step 1-3.

6.2. In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

6.3. The UE shall consider this random access response reception successful and transmit the msg3.

6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The UE shall consider this random access response reception successful and transmit the msg3.

6.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.1.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.1.5 Test requirement

Tables 6.2.1.5-1 and 6.2.1.5-2 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.1.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.1/2 FDD Note 1	As defined in D.1.1/2.
PDSCH parameters Note 4		DL Reference Measurement Channel R.0 FDD Note 4	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io [Note 2]	dBm/9 MHz	-65.5	
RSRP [Note 3]	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter. Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.			

Table 6.2.1.5-2: RACH-Configuration parameters for E-UTRAN FDD - Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
mac-ContentionResolutionTimer	sf48	48 sub-frames
maxHARQ-Msg3Tx	4	
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.1.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.1.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.1.5-5.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.1.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.1.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.1.5-5.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the contention resolution timer expires.

Table 6.2.1.5-3: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	Extreme Conditions
± 10.5 dB	± 13.5 dB

Table 6.2.1.5-4: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.1.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.2 E-UTRAN FDD - Non-Contention Based Random Access Test

6.2.2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD non-contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.2.2.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.2 and A.6.2.2.

6.2.2.4 Test description

6.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.2.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE via a PDCCH order.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Tables 6.2.2.5-1 and 6.2.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.
4. Test 1: Correct behaviour when receiving Random Access Response

   4.1 In Test 1, the UE shall send the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4. The UE shall consider this random access response reception successful.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.2.5-3 and 6.2.2.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.2.5-4 and 6.2.2.5-5.

5. Test 2: Correct behaviour when not receiving Random Access Response

   5.1. Repeat step 1-3.

5.2. In Test 2, the UE shall send the signalled preamble to the SS. The SS shall not respond to the first 4 preamble.

5.3. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5. The UE shall consider this random access response reception successful.

5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.2.5-3 and 6.2.2.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.2.5-4 and 6.2.2.5-5.

6.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.2.4.3-1: Common Exception messages for E-UTRAN FDD - Non-Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.2.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.2.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		

Table 6.2.2.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.2.5 Test requirement

Tables 6.2.2.5-1 and 6.2.2.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test. Table 6.2.2.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 FDD	As defined in D.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.			

Table 6.2.2.5-2: RACH-Configuration parameters for E-UTRAN FDD - Non-Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
Ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.2.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.2.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.2.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.2.5-3..
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.2.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.2.5-5.

Table 6.2.2.5-3: Absolute power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test

Tolerance	
Normal Conditions	Extreme Conditions
± 10.5 dB	± 13.5 dB

Table 6.2.2.5-4: Relative power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.2.5-5: Test requirements for Te Timing Error Limit for E-UTRAN FDD – Non-Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.3 E-UTRAN TDD - Contention Based Random Access Test

6.2.3.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.2.3.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1 and A.6.2.3.

6.2.3.4 Test description

6.2.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.3.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

1. Ensure the UE is in State 2A-RF according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to Tables 6.2.3.5-1 and 6.2.3.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The UE set up a connection with SS, and the random access procedure used in the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response reception

4.1 In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

4.2 The UE shall consider the random access response reception not successful then re- select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

4.4 The UE shall consider this random access response reception successful and transmit the msg3.

4.5 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.3.5-3 and 6.2.3.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.3.5-4 and 6.2.3.5-5.

5. Test 2: Correct behaviour when *not* receiving random access response reception

5.1 Repeat step 1-3.

5.2 In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

5.3 The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 10 sub-frames.

5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5 The UE shall consider this random access response reception successful and transmit the msg3.

5.6 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.3.5-3and 6.2.3.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.3.5-4 and 6.2.3.5-5.

6. Test 3: Correct behaviour when receiving a NACK on msg3

6.1 Repeat step 1-3.

6.2 In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

6.3 The UE shall consider this random access response reception successful and transmit the msg3.

6.4 The SS shall send NACK all UE msg3 following a successful random access response.

6.5 The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1 Repeat step 1-3.

7.2 In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after first preambles have been received by the SS.

7.3 The UE shall consider this random access response reception successful and transmit the msg3.

7.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5 The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

   8.1 Repeat step 1-3

   8.2 In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

   8.3 The UE shall consider this random access response reception successful and transmit the msg3.

   8.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

   8.5 The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

   9.1 Repeat step 1-3.

   9.2 In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble have been received by the SS.

   9.3 The UE shall consider this random access response reception successful and transmit the msg3.

   9.4 The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

   9.5 The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

6.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.3.4.3-1: Common Exception messages for E-UTRAN TDD -Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.3.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.3.5 Test requirement

Tables 6.2.3.5-1 and 6.2.3.5-2 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.3.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.1/2 TDD Note 1	As defined in D.2.1/2.
PDSCH parameters Note 4		DL Reference Measurement Channel R.0 TDD Note 4	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211 [9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211 [9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter. Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the DUT is required.			

Table 6.2.3.5-2: RACH-Configuration parameters for E-UTRAN TDD - Contention Based Random Access test

Field	Value	Comment
numberOfRA-Preambles	n52	
sizeOfRA-PreamblesGroupA	n52	No group B.
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
mac-ContentionResolutionTimer	sf48	48 sub-frames
maxHARQ-Msg3Tx	4	
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.3.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.3.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.3.5-5.

Test 2: Correct behaviour when not receiving random access response reception

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.3.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.3.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.3.5-5.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the contention resolution timer expires.

Table 6.2.3.5-3: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	Extreme Conditions
± 10.5 dB	± 13.5 dB

Table 6.2.3.5-4: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.3.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.4 E-UTRAN TDD - Non-Contention Based Random Access Test

6.2.4.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing are within the specified limits.

6.2.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.2.4.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if no Random Access Response is received within the RA response window.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.2 and A.6.2.4.

6.2.4.4 Test description

6.2.4.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.4.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE via a PDCCH order.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 6.2.4.5-1 and 6.2.4.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

4. Test 1: Correct behaviour when receiving Random Access Response

4.1. In Test 1, the UE shall send the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

4.2 The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

4.4 The UE shall consider this random access response reception successful.

4.5 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.4.5-3 and 6.2.4.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.4.5-4 and 6.2.4.5-5.

5. Test 2: Correct behaviour when *not* receiving Random Access Response

5.1 Repeat step 1-3.

5.2 In Test 2, the UE shall send the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

5.3 The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5 The UE shall consider this random access response reception successful.

5.6 Measure the power and timing of the first preamble and it shall not exceed the values specified in clause Tables 6.2.4.5-3 and 6.2.4.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.4.5-4 and 6.2.4.5-5.

6.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.4.4.3-1: Common Exception messages for E-UTRAN TDD - Non-Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.4.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC
}			

Table 6.2.4.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

Table 6.2.4.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.4.5 Test requirement

Tables 6.2.4.5-1 and 6.2.4.5-2 define the primary level settings for E-UTRAN TDD - non-contention based random access test. Table 6.2.4.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Non-Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 TDD	As defined in D.2.1.
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211 [9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211 [9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.			

Table 6.2.4.5-2: RACH-Configuration parameters for E-UTRAN TDD – Non-Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
Ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.4.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.4.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.4.5-5.

Test 2: Correct behaviour when *not* receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.4.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.4.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.4.5-5.

Table 6.2.4.5-3: Absolute power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB

Table 6.2.4.5-4: Relative power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	**Extreme Conditions**
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.4.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Non-Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.5 E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth

6.2.5.1 Test purpose

Same test purpose as defined in clause 6.2.1.1.

6.2.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support Band 31.

6.2.5.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.1.3 with the following exceptions:

- Instead of A.6.2.1 → use A.6.2.5.

6.2.5.4 Test description

6.2.5.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.5.4.2 Test procedure

Same test procedure as defined in clause 6.2.1.4.2 with the following exceptions:

- Instead of Table 6.2.1.5-1 → use Table 6.2.5.5-1.

6.2.5.4.3 Message contents

Same message contents as defined in clause 6.2.1.4.3.

6.2.5.5 Test requirement

Same test requirement as defined in clause 6.2.1.5 with the following exceptions:

Tables 6.2.5.5-1 and 6.2.1.5-2 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.1.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Contention Based Random Access test for 5MHz bandwidth

Parameter	Unit	Value	Comments
$BW_{channel}$	MHz	5	
OCNG Pattern Note 1		OP.15/16 FDD Note 1	As defined in D.1.15/16.
PDSCH parameters Note 2		DL Reference Measurement Channel R.5 FDD Note 2	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As defined in A.2.1.
Io Note 2	dBm/4.5 MHz	**-68.5**	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel. Note 2: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required. Note 3: See Table 6.2.1.5-1 for the other parameters. Note 4: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

6.2.6 E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth

6.2.6.1 Test purpose

Same test purpose as defined in clause 6.2.2.1.

6.2.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support band 31.

6.2.6.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.2.3 with the following exceptions:

- Instead of A.6.2.2 → use A.6.2.6.

6.2.6.4 Test description

6.2.6.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.6.4.2 Test procedure

Same test procedure as defined in clause 6.2.2.4.2 with the following exceptions:

- Instead of Table 6.2.2.5-1 → use Table 6.2.6.5-1.

6.2.6.4.3 Message contents

Same message contents as defined in clause 6.2.2.4.3.

6.2.6.5 Test requirement

Same test requirement as defined in clause 6.2.2.5 with the following exceptions:

Tables 6.2.6.5-1 and 6.2.2.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test for 5MHz bandwidth. Table 6.2.2.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.6.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test for 5MHz bandwidth

Parameter	Unit	Value	Comments
$BW_{channel}$	MHz	5	
OCNG Pattern Note 1		OP.15 FDD Note 1	As defined in D.1.15.
PDSCH parameters Note 2		DL Reference Measurement Channel R.5 FDD Note 2	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As defined in A.2.1.
Io Note 2	dBm/4.5 MHz	-68.5	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: See Table 6.2.2.5-1 for the other parameters. Note 4: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG

6.2.7.1 Test purpose

To verify that the UE behaviour of the random access procedure, for the SCell, is according to the E-UTRAN FDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing, for the SCell, are within the specified limits.

6.2.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

6.2.7.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213 [8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321 [11]. Contention based random access procedures can only be carried out on PCell, while non-contention based random access procedures can be carried out on both PCell and an activated SCell.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213 [8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101 [2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on PCell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2 and A.6.2.7.

6.2.7.4 Test description

6.2.7.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG).Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

6.2.7.4.2 Test procedure

This test consists of two cells. Cell 1 is PCell and Cell 2 is SCell. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow the SCell to be configured and to handle the Random Access Response which takes place on PCell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 6.2.7.5-1 and 6.2.7.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall signal, on Cell 2, the SCell, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

7. Test 1: Correct behaviour when receiving Random Access Response

    7.1. In Test 1, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

    7.2. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

    7.3. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

    7.4. The UE shall consider this random access response reception successful.

    7.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.7.5-3 and 6.2.7.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.7.5-4 and 6.2.7.5-5.

8. Test 2: Correct behaviour when not receiving Random Access Response

    8.1. Repeat step 1-6.

8.2. In Test 2, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

8.3. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

8.4. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

8.5. The UE shall consider this random access response reception successful.

8.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.7.5-3 and 6.2.7.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.7.5-4 and 6.2.7.5-5.

9. Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

9.1. Repeat step 1-6.

9.2. In Test 3, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 5 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

9.3. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

9.4. The SS shall still transmit on PCell Cell 1 a random access response containing a random access preamble identifier not corresponding to the transmitted random access after 5 preambles have been received by the SS.

9.5. The UE shall consider this random access response reception not successful and stop to transmit the preamble on SCell Cell 2.

9.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.7.5-3 and 6.2.7.5-5. Measure the relative power and timing applied to additional preambles (last 5 preambles) and it shall not exceed the values specified in Tables 6.2.7.5-4 and 6.2.7.5-5.

6.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.7.4.3-1: Common Exception messages for E-UTRAN FDD - Non-Contention Based Random Access for Scell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.7.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.7.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 6.2.7.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.7.4.3-5: *SCellToAddMod-r10:* Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 6.2.7.4.3-6: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
rach-ConfigCommonSCell-r11 SEQUENCE {			
powerRampingParameters-r11 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo-r11 SEQUENCE {			
preambleTransMax-r11	n6		
}			
}			
prach-ConfigSCell-r11 SEQUENCE {			
rootSequenceIndex	See TS 36.508 [18] clause 4.4.2, Table 4.4.2-1A and clause 6.3.2.2 Table 6.3.2.2-2	See table 5.7.2-4 in TS 36.211 [41] for PRACH format 0-3	FDD
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		FDD
highSpeedFlag	FALSE		
zeroCorrelationZoneConfig			
prach-FreqOffset	See TS 36.508 [18] clause 4.6.8	Channel-bandwidth-dependent parameter	
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 6.2.7.4.3-7: *RadioResourceConfigDedicatedSCell-r10*: Additional E-UTRAN FDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

6.2.7.5 Test requirement

Tables 6.2.7.5-1 and 6.2.7.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test for SCell. Table 6.2.7.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.7.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

Parameter	Unit	Cell 1	Cell 2	Comments
E-UTRA RF Channel Number		1	2	
$BW_{channel}$	MHz	10	10	
Active PCell		Cell 1		Primary cell of RF channel number 1.
Active SCell			Cell 2	Secondary cell of RF channel number 2.
TAG configuration		pTAG	sTAG	pTAG+sTAG configures Cell 1 and Cell 2 to separate TAGs
OCNG Pattern		OP.1 FDD	OP.1 FDD	As defined in D.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	DL Reference Measurement Channel R.0 FDD	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	0	
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	3	3	
N_{oc}	dBm/15 KHz	-98	-98	
$\hat{E}_s/N_{oc}$	dB	3	3	
Io Note 2	dBm/9 MHz	-65.5	-65.5	
RSRP Note 3	dBm/15 KHz	-95	-95	
referenceSignalPower	dBm/15 KHz	-5	-5	As defined in clause 6.3.2 in TS 36.331 [5].
Configured UE transmitted power ($P_{\text{CMAX,c}}$)	dBm	23	23	As defined in clause 6.2.5 in TS 36.101 [2].
PRACH Configuration Index	-	4	4	As defined in table 5.7.1-2 in TS 36.211 [9].
Backoff Parameter Index	-	2	2	As defined in table 7.2-1 in TS 36.321 [11].
Propagation Condition	-	AWGN	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.				

Table 6.2.7.5-2: RACH-Configuration parameters for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Clause 6.3.2 in TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.7.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.7.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.7.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.7.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.7.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.7.5-5.

Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.7.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.7.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.7.5-5.

Table 6.2.7.5-3: Absolute power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

Conditions	Tolerance
Normal	± 10.5 dB
Extreme	± 13.5 dB

Table 6.2.7.5-4: Relative power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test for SCell

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.7.5-5: Test requirements for Te Timing Error Limit for E-UTRAN FDD – Non-Contention Based Random Access test for SCell

Downlink Bandwidth (MHz)	T_e
≥3	15*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG

6.2.8.1 Test purpose

To verify that the UE behaviour of the random access procedure, for the SCell, is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing, for the SCell, are within the specified limits.

6.2.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

6.2.8.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213 [8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321 [11]. Contention based random access procedures can only be carried out on PCell, while non-contention based random access procedures can be carried out on both PCell and an activated SCell.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213 [8] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101 [2].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached for the random access procedure on PCell as specified in clause 5.1.4 in TS 36.321 [11].

The UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2 and A.6.2.8.

6.2.8.4 Test description

6.2.8.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG).Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

6.2.8.4.2 Test procedure

This test consists of two cells. Cell 1 is PCell and Cell 2 is SCell. PCell and SCell are different timing advance group. Cell 1 is in the primary Timing Advance Group (pTAG) and Cell 2 is in the secondary Timing Advance Group (sTAG). The purpose of the PCell is to allow the SCell to be configured and to handle the Random Access Response which takes place on PCell.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 6.2.8.5-1 and 6.2.8.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall signal, on Cell 2, the SCell, a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.

7. Test 1: Correct behaviour when receiving Random Access Response

   7.1. In Test 1, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

   7.2. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

   7.3. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   7.4. The UE shall consider this random access response reception successful.

   7.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.8.5-3 and 6.2.8.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

8. Test 2: Correct behaviour when not receiving Random Access Response

   8.1. Repeat step 1-6.

   8.2. In Test 2, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. The SS shall not respond to the first 4 preambles.

   8.3. The UE shall consider the random access response reception not successful then re-transmit the preamble with the calculated PRACH transmission power.

   8.4. The SS shall transmit on PCell Cell 1 a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   8.5. The UE shall consider this random access response reception successful.

   8.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.8.5-3 and 6.2.8.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

9. Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

   9.1. Repeat step 1-6.

   9.2. In Test 3, the UE shall send, on Cell 2, the SCell, the signalled preamble to the SS. In response to the first 5 preambles, the SS shall transmit on PCell Cell 1 a random access response not corresponding to the transmitted random access preamble.

9.3. The UE shall consider the random access response reception not successful then re-transmit the preamble on SCell Cell 2 with the calculated PRACH transmission power.

9.4. The SS shall still transmit on PCell Cell 1 a random access response containing a random access preamble identifier not corresponding to the transmitted random access after 5 preambles have been received by the SS.

9.5. The UE shall consider this random access response reception not successful and stop to transmit the preamble on SCell Cell 2.

9.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.8.5-3 and 6.2.8.5-5. Measure the relative power and timing applied to additional preambles (last 5 preambles) and it shall not exceed the values specified in Tables 6.2.8.5-4 and 6.2.8.5-5.

6.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.8.4.3-1: Common Exception messages for E-UTRAN TDD - Non-Contention Based Random Access for Scell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.8.4.3-2: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.8.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 6.2.8.4.3-4: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.8.4.3-5: *SCellToAddMod-r10:* Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 6.2.8.4.3-6: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
rach-ConfigCommonSCell-r11 SEQUENCE {			
powerRampingParameters-r11 SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo-r11 SEQUENCE {			
preambleTransMax-r11	n6		
}			
}			
prach-ConfigSCell-r11 SEQUENCE {			
rootSequenceIndex	See TS 36.508 [18] clause 4.4.2, Table 4.4.2-1A and clause 6.3.2.2 Table 6.3.2.2-2	See table 5.7.2-5 in TS 36.211 [41] for PRACH format 4	
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	53		
highSpeedFlag	FALSE		
zeroCorrelationZoneConfig			
prach-FreqOffset	See TS 36.508 [18] clause 4.6.8	Channel-bandwidth-dependent parameter	
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 6.2.8.4.3-7: *RadioResourceConfigDedicatedSCell-r10*: Additional E-UTRAN TDD - Non-Contention Based Random Access test for Scell requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicatedSCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

6.2.8.5 Test requirement

Tables 6.2.8.5-1 and 6.2.8.5-2 define the primary level settings for E-UTRAN TDD - non-contention based random access test for SCell. Table 6.2.8.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.8.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

Parameter	Unit	Cell 1	Cell 2	Comments
E-UTRA RF Channel Number	-	1	1	
$BW_{channel}$	MHz	10	10	
Active PCell		Cell 1		Primary cell of RF channel number 1.
Active SCell			Cell 2	Secondary cell of RF channel number 2.
TAG configuration		pTAG	sTAG	pTAG+sTAG configures Cell 1 and Cell 2 to separate TAGs
OCNG Pattern	-	OP.1 TDD	OP.1 TDD	As defined in D.2.1.
PDSCH parameters	-	DL Reference Measurement Channel R.0 TDD	DL Reference Measurement Channel R.0 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters	-	DL Reference Measurement Channel R.6 TDD	DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	6	As specified in table 4.2-1 in TS 36.211 [9].
Uplink-downlink configuration	-	1	1	As specified in table 4.2-2 in TS 36.211 [9].
PBCH_RA	dB	0	0	
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$\hat{E}_s/I_{ot}$	dB	3	3	
N_{oc}	dBm/15 KHz	-98	-98	
$\hat{E}_s/N_{oc}$	dB	3	3	
Io Note 2	dBm/9 MHz	-65.5	-65.5	
RSRP Note 3	dBm/15 KHz	-95	-95	
referenceSignalPower	dBm/15 KHz	-5	-5	As defined in clause 6.3.2 in TS 36.331 [5].
Configured UE transmitted power ($P_{CMAX,c}$)	dBm	23	23	As defined in clause 6.2.5 in TS 36.101 [2].
PRACH Configuration Index	-	53	53	As defined in table 5.7.1-3 in TS 36.211 [9].
Backoff Parameter Index	-	2	2	As defined in table 7.2-1 in TS 36.321 [11].
Propagation Condition	-	AWGN	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.				

Table 6.2.8.5-2: RACH-Configuration parameters for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Clause 6.3.2 in TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified Table 6.2.8.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.8.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.8.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -22 dBm to within the accuracy specified in Table 6.2.8.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.8.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.8.5-5.

Test 3: Correct behaviour when maximum number of preamble transmission counter has been reached

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.8.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.8.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.8.5-5.

Table 6.2.8.5-3: Absolute power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

Conditions	Tolerance
Normal	± 10.5 dB
Extreme	± 13.5 dB

Table 6.2.8.5-4: Relative power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test for SCell

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.8.5-5: Test requirements for Te Timing Error Limit for E-UTRAN TDD – Non-Contention Based Random Access test for SCell

Downlink Bandwidth (MHz)	T_e
≥3	15*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.9

6.2.10 E-UTRAN FDD - Contention based random access test for Cat-M1 UEs in normal coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Annex E needs to be updated
- Some requirements in Test 1 and Test 2 are still within square brackets in TS36.133
- prach-StartingSubframe is smaller than numRepetitionPerPreambleAttempt for Level 2 and Level 3 in Table 6.2.10.5-3, which violates TS 36.331 spec. It needs to be corrected in TS 36.133.

6.2.10.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a Cat-M1 UE in Normal Coverage is according to the E-UTRAN FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.1.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits and that the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1.

6.2.10.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

In addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources [5] configured for the corresponding enhanced coverage level as determined in the previous step;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.10.

The test parameters are given in Tables 6.2.10.5-1, 6.2.10.5-2 and 6.2.10.5-3.

6.2.10.4 Test description

6.2.10.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.10.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the Cat-M1 UE.

1. Ensure the CAT-M1 UE is in State 2A-RF-CE
2. Set the parameters according to Tables 6.2.10.5-1, 6.2.10.5-2 and 6.2.10.5-3 as appropriate where CE level 0 shall be used. Propagation conditions are set according to Annex B clause B.1.1.
3. The CAT-M1 UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response

   4.1. In Test 1, the CAT-M1 UE shall send the preamble to the SS. In response to the first [4] preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after [5] preambles have been received by the SS.

4.4. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.10.5-4 and 6.2.10.5-6. The power of the first preamble shall be -30 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.10.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.10.5-6.

5. Test 2: Correct behaviour when not receiving random access response

5.1. Repeat step 1-3.

5.2. In Test 2, the CAT-M1 UE shall send the preamble to the SS. The SS shall not respond to the first [4] preambles.

5.3. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 20 sub-frames.

5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after [5] preambles have been received by the SS.

5.5. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.10.5-4 and 6.2.10.5-6. The power of the first preamble shall be -30 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.10.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.10.5-6.

6. Test 3: Correct behaviour when receiving a NACK on msg3

6.1. Repeat step 1-3.

6.2. In Test 3, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

6.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The CAT-M1 UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The CAT-M1 UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the CAT-M1 UE shall send the preamble to the SS.

10.3. The CAT-M1 UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 0. The SS shall verify that the UE is transmitting at coverage level 0.

6.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.10.4.3-1: Common Exception messages for E-UTRAN FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.6-1a Table H.2.6-2 Table H.2.6-3

Table 6.2.10.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD – Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.10.5 Test requirement

Tables 6.2.10.5-1, 6.2.10.5-2 and 6.2.10.5-3 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.10.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.10.4.2, the power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.10.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.10.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.10.5-6.

Table 6.2.10.5-1: General test parameters for FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.20 FDD	As defined in TS 36.133 [4] clause A.3.1.4.1
MPDCCH parameters Note 2		R.16 FDD	As defined in TS 36.133 [4] clause A.3.1.3.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in TS 36.133 [4] clause A.3.1.2.1
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3+TT	
$\hat{E}_s/I_{ot}$ Note 3	dB	3+TT	
RSRP Note 3	dBm/15 KHz	-95+TT	
Io Note 3	dBm/9 MHz	-65.5+TT	
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel. Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.			

Table 6.2.10.5-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.10.5-3: PRACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{24, 31, 38}				Corresponding to {-116, -109, -102} dBm as defined in TS36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	23 dBm				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	Sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.10.5-4: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 9 dB+TT	± 12 dB+TT
Note: TS 36.133 [4] clause A.6.2.10.2 and TS 36.101 [2] clause 6.3.5.1.1.	

Table 6.2.10.5-5: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.0+TT	± 5.0+TT
Note 1: TS 36.133 [4] clause A.6.2.10.2 and TS 36.101 [2] clause 6.3.5.2.1. Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations.		

Table 6.2.10.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
1.4	24*T_S
≥ 3	12*T_S
Note 1: TS 36.133 [4] clauses A.6.2.10.2 and clause 7.1.2. Note 2: T_S is the basic timing unit defined in TS 36.211 [9].	

6.2.11 E-UTRAN HD-FDD - Contention based random access test for Cat-M1 UEs in normal coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined.

- The Test tolerances applicable to this test are undefined.

- Annex E needs to be updated.

- Some requirements in Test 1 and Test 2 are still within square brackets in TS36.133.

6.2.11.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a Cat-M1 UE in Normal Coverage is according to the E-UTRAN HD-FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.1.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits and that the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.11.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1.

6.2.11.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The CAT-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The CAT-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The CAT-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

In addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources [5] configured for the corresponding enhanced coverage level as determined in the previous step;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.10.

The test parameters are given in Tables 6.2.11.5-1, 6.2.11.5-2 and 6.2.11.5-3.

6.2.11.4 Test description

6.2.11.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.11.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the Cat-M1 UE.

1. Ensure the CAT-M1 UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2.
2. Set the parameters according to Tables 6.2.11.5-1, 6.2.11.5-2 and 6.2.11.5-3 as appropriate, where the CE level 0 shall be used in this test. Propagation conditions are set according to Annex B clause B.1.1.
3. The CAT-M1 UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response
   4.1. In Test 1, the CAT-M1 UE shall send the preamble to the SS. In response to the first [4] preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.
   4.2. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.
   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after [5] preambles have been received by the SS.
   4.4. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.
   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.11.5-4 and 6.2.11.5-6. The power of the first preamble shall be -30 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.11.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.11.5-6.
5. Test 2: Correct behaviour when not receiving random access response
   5.1. Repeat step 1-3.
   5.2. In Test 2, the CAT-M1 UE shall send the preamble to the SS. The SS shall not respond to the first [4] preambles.
   5.3. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 20 sub-frames.
   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after [5] preambles have been received by the SS.
   5.5. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.
   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified Tables 6.2.11.5-4 and 6.2.11.5-6. The power of the first preamble shall be -30 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.11.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.11.5-6.
6. Test 3: Correct behaviour when receiving a NACK on msg3
   6.1. Repeat step 1-3.
   6.2. In Test 3, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.
   6.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.
   6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The CAT-M1 UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The CAT-M1 UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.1. In Test 7, the CAT-M1 UE shall send the preamble to the SS.

10.3. The CAT-M1 UE shall determines the enhanced coverage level 0 based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36,321 [11].

10.4. The CAT-M1 UE shall selects PRACH resources configured for the corresponding enhanced coverage level 0 as determined in the previous step.

10.5. The CAT-M1 UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 0.

6.2.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.11.4.3-1: Common Exception messages for E-UTRAN HD-FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.6-1 Table H.2.6-2 Table H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.11.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN HD-FDD – Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

6.2.11.5 Test requirement

Tables 6.2.11.5-1, 6.2.11.5-2 and 6.2.11.5-3 define the primary level settings for E-UTRAN HD-FDD - contention based random access test. Table 6.2.11.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.11.4.2, the power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.11.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.11.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.11.5-6.

Table 6.2.11.5-1: General test parameters for HD-FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.10 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.4.2
MPDCCH parameters Note 2		R.6 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.3.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.2.3
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3+TT	
$\hat{E}_s/I_{ot}$ Note 3	dB	3+TT	
RSRP Note 3	dBm/15 KHz	-95+TT	
Io Note 3	dBm/9 MHz	-65.5+TT	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.11.5-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.11.5-3: PRACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{24, 31, 38}				Corresponding to {-116, -109, -102} dBm as defined in TS36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	23 dBm				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	Sf16	sf64	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.11.5-4: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 9 dB+TT	± 12 dB+TT
Note: TS 36.133 [4] clause A.6.2.11.2 and TS 36.101 [2] clause 6.3.5.1.1.	

Table 6.2.11.5-5: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.0+TT	± 5.0+TT
Note 1: TS 36.133 [4] clause A.6.2.11.2 and TS 36.101 [2] clause 6.3.5.2.1. Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations.		

Table 6.2.11.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
1.4	24*T_S
≥ 3	12*T_S
Note 1: TS 36.133 [4] clauses A.6.2.11.2 and clause 7.1.2. Note 2: T_S is the basic timing unit defined in TS 36.211 [9].	

6.2.12 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Some requirements in Test 1 and Test 2 are still within square brackets in TS36.133

6.2.12.1 Test purpose

To verify whether the behaviour of the random access procedure of a Cat-M1 UE in Normal Coverage is according to the E-UTRAN TDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.1.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits and that the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1.

6.2.12.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The Cat-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2].

The Cat-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The Cat-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The Cat-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

In addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources [5] configured for the corresponding enhanced coverage level as determined in the previous step;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.12.

The test parameters are given in tables 6.2.12.5-1, 6.2.12.5-2 and 6.2.12.5-3.

6.2.12.4 Test description

6.2.12.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18(using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.12.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the Cat-M1 UE.

1. Ensure the Cat-M1 UE is in State 2A-RF-CE according to TS 36.508 [7] clause 7.2A.2.

2. Set the parameters according to Tables 6.2.12.5-1, 6.2.12.5-2 and 6.2.12.5-3 as appropriate where CE level 0 shall be used. Propagation conditions are set according to Annex B clause B.1.1.

3. The Cat-M1 UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response.

   4.1 In Test 1, the Cat-M1 UE shall send the preamble to the SS. In response to the first [4] preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2 The Cat-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after [5] preambles have been received by the SS.

   4.4 The Cat-M1 UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.12.5-4 and 6.2.12.5-6. The power of the first preamble shall be -30 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.12.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.12.5-6.

5. Test 2: Correct behaviour when not receiving random access response reception.

   5.1 Repeat step 1-3.

   5.2 In Test 2, the Cat-M1 UE shall send the preamble to the SS. The SS shall not respond to the first [4] preambles.

   5.3 The Cat-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 20 sub-frames.

   5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after [5] preambles have been received by the SS.

   5.5 The UE shall consider this random access response reception successful and transmit the msg3.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.12.5-4 and 6.2.12.5-6. The power of the first preamble shall be -30 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.12.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.12.5-6.

6. Test 3: Correct behaviour when receiving a NACK on msg3.

   6.1 Repeat step 1-3.

   6.2 In Test 3, the Cat-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

   6.3 The Cat-M1 UE shall consider this random access response reception successful and transmit the msg3.

   6.4 The SS shall send NACK all UE msg3 following a successful random access response.

   6.5 The Cat-M1 UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI.

   7.1 Repeat step 1-3.

7.2 In Test 4, the Cat-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after first preambles have been received by the SS.

7.3 The Cat-M1 UE shall consider this random access response reception successful and transmit the msg3.

7.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5 The Cat-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI.

8.1 Repeat step 1-3.

8.2 In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

8.3 The Cat-M1 UE shall consider this random access response reception successful and transmit the msg3.

8.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.5 The Cat-M1 UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires.

9.1 Repeat step 1-3.

9.2 In Test 6, the Cat-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble have been received by the SS.

9.3 The Cat-M1 UE shall consider this random access response reception successful and transmit the msg3.

9.4 The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5 The Cat-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The Cat-M1 UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the Cat-M1 UE shall send the preamble to the SS.

10.3. The Cat-M1 UE shall determines the enhanced coverage level 0 based on the RSRP measurement and the configured criterion (RSRP-ThresholdsPrach in TS 36.331 [5]) as defined in section 5.1.1, TS 36,321 [11].

10.4. The Cat-M1 UE shall selects PRACH resources configured for the corresponding enhanced coverage level 0 as determined in the previous step.

10.5. The Cat-M1 UE shall transmit or re-transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 0.

6.2.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.12.4.3-1: Common Exception messages for E-UTRAN TDD -Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	H.2.6-1 H.2.6-2 H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.12.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.12.4.3-3: *RACH-ConfigCommon-DEFAULT*: E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-12			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
preamblesGroupAConfig SEQUENCE {			
sizeOfRA-PreamblesGroupA	n52	No group B.	
}			
}			
}			
RACH-CE-LevelInfoList-r13 ::= SEQUENCE (SIZE (1..maxCE-Level-r13)) OF SEQUENCE {			
preambleMappingInfo-r13[1] SEQUENCE {			
firstPreamble-r13	0		
lastPreamble-r13	9		
}			
preambleMappingInfo-r13[2] SEQUENCE {			
firstPreamble-r13	10		
lastPreamble-r13	19		
}			
}			

Table 6.2.12.4.3-4: *PRACH-Config-v1310-DEFAULT*: E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7A			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entry		
RSRP-Range[1]	24	-116 dBm	
RSRP-Range[2]	31	-109 dBm	
RSRP-Range[3]	38	-102 dBm	
}			
PRACH-Config-v1310-DEFAULT ::= SEQUENCE {			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	2 entries		
PRACH-ParametersCE-r13[1] SEQUENCE {			
prach-ConfigIndex-r13[1]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[1]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n3		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		
}			
mpdcch-NumRepetition-RA-r13[1]	r8		
prach-HoppingConfig-r13[1]	off		
}			
prach-ConfigIndex-r13[2]	53	INTEGER (0..63)	TDD
prach-FreqOffset-r13[2]	Same as prach-FrequencyOffset		
prach-StartingSubframe-r13[2]	sf4		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n4		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2] {	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		
}			
mpdcch-NumRepetition-RA-r13[2]	r8		
prach-HoppingConfig-r13[2]	off		
}			
}			
}			

6.2.12.5 Test requirement

Tables 6.2.12.5-1, 6.2.12.5-2 and 6.2.12.5-3 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.12.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.12.4.2, the power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.12.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.12.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.12.5-6.

Table 6.2.12.5-1: Cell Specific Test requirement parameters for TDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.11 TDD	As defined in TS 36.133 [4] clause A.3.2.2.11.
PDSCH parameters Note 2		R.16 TDD	As defined in TS 36.133 [4] clause A.3.1.4.3
MPDCCH parameters Note 2		R.14 TDD	As defined in TS 36.133 [4] clause A.3.1.3.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in TS 36.133 [4] clause A.3.1.2.2
Special subframe configuration	-	6	As specified in table 4.2-1 in TS 36.211 [11].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in TS 36.211 [11].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
$\hat{E}_s/I_{ot}$ Note 3	dB	3	
RSRP Note 3	dBm/15 KHz	-95	
Io Note 3	dBm/9 MHz	-65.5	
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel. Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required. Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.			

Table 6.2.12.5-2: RACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
numberOfRA-Preambles	n52				
sizeOfRA-PreamblesGroupA	n52				No group B.
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note 1: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.12.5-3: PRACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{24, 31, 38}				Corresponding to {-116, -109, -102} dBm as defined in Section 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	23 dBm				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	**Level 0**	**Level 1**	**Level 2**	**Level 3**	
prach-ConfigIndex	53	53	53	53	As defined in table 5.7.1-3 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	sf8	sf16	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.12.5-4: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.12.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.12.5-5: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
$2 \leq \Delta P < 3$	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.12.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.12.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$27 * T_S$
≥3	$15 * T_S$
Note 1: TS 36.133 [4] clauses A.6.2.12.2 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.13 E-UTRAN FDD - Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Test tolerances applicable to this test related to rsrp-ThresholdsPrach values for CE levels, RSRP level and UE RSRP accuracy in normal conditions and extreme condition are undefined

6.2.13.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a Cat-M1 UE in Enhanced Coverage is according to the E-UTRAN FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits, and whether the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.13.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

6.2.13.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

Per TS 36.133 [4] clause 6.2.3, in addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources (TS 36.331 [5]) configured for the corresponding enhanced coverage level as determined in the previous step and;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.13.

The test parameters are given in Tables 6.2.13.5-1, 6.2.13.5-2 and 6.2.13.5-3.

6.2.13.4 Test description

6.2.13.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.13.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the Cat-M1 UE.

1. Ensure the CAT-M1 UE is in State 2A-RF-CE

2. Set the parameters according to Tables 6.2.13.5-1, 6.2.13.5-2 and 6.2.13.5-3 as appropriate where CE level 2 shall be used. Propagation conditions are set according to Annex B clause B.1.1.

3. The CAT-M1 UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response

   4.1. In Test 1, the CAT-M1 UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles (the preamble may be transmitted multiple times in each attempt) have been received by the SS.

   4.4. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.13.5-4 and 6.2.13.5-6. The power of the first preamble shall be -27 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.13.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.13.5-6.

5. Test 2: Correct behaviour when not receiving random access response

   5.1. Repeat step 1-3.

   5.2. In Test 2, the CAT-M1 UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

   5.3. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 80 sub-frames.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.13.5-4 and 6.2.13.5-6. The power of the first preamble shall be -27 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.13.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.13.5-6.

6. Test 3: Correct behaviour when receiving a NACK on msg3

   6.1. Repeat step 1-3.

   6.2. In Test 3, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   6.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

   6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

   6.5. The CAT-M1 UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

   7.1. Repeat step 1-3.

7.2. In Test 4, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in msg3 uplink message.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The CAT-M1 UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the CAT-M1 UE shall send the preamble to the SS.

10.3. The CAT-M1 UE shall determines the enhanced coverage level 2 based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36,321 [11].

10.4. The CAT-M1 UE shall selects PRACH resources configured for the corresponding enhanced coverage level 2 as determined in the previous step.

10.5. The CAT-M1 UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 2.

6.2.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.13.4.3-1: Common Exception messages for E-UTRAN FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.6-1 Table H.2.6-2 Table H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.13.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN FDD – Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.13.4.3-3: Exceptions in PRACH-ConfigSIB-v1310-DEFAULT for FDD contention based random access test in enhanced coverage

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7b PRACH-ConfigSIB-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries	Threshold values to determine the CE Level 1, 2 and 3 for PRACH. RSRP-Range values according to mapping table in TS36.133[4] Table 9.1.14.3.3-1.	CEModeB PRACH_4CE
RSRP-Range[1]	47	-93 dBm	
RSRP-Range[2]	37	-103 dBm	
RSRP-Range[3]	23	-117 dBm	
}			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries	1: CE Level 0 2: CE Level 1 3: CE Level 2 4: CE Level 3	CEModeB PRACH_4CE
prach-ConfigIndex-r13[1]	4		FDD
prach-FreqOffset-r13[1]	0		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n3		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[1]	r8		
prach-HoppingConfig-r13[1]	Off		
prach-ConfigIndex-r13[2]	4		FDD
prach-FreqOffset-r13[2]	0		
prach-StartingSubframe-r13[2]	sf4		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n4		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[2]	r8		
prach-HoppingConfig-r13[2]	Off		
prach-ConfigIndex-r13[3]	4		FDD
prach-FreqOffset-r13[3]	0		
prach-StartingSubframe-r13[3]	sf8		
maxNumPreambleAttemptCE-r13[3]	n7		
numRepetitionPerPreambleAttempt-r13[3]	n16		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[3]	r128		
prach-HoppingConfig-r13[3]	Off		
prach-ConfigIndex-r13[4]	4		FDD
prach-FreqOffset-r13[4]	0		
prach-StartingSubframe-r13[4]	sf16		
maxNumPreambleAttemptCE-r13[4]	n10		
numRepetitionPerPreambleAttempt-r13[4]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[4]	r128		
prach-HoppingConfig-r13[4]	Off		
}			
}			

Condition	Explanation
FDD	FDD cell environment
RF	Used for RF, performance and RRM testing
CEmodeB	Used for CE mode B testing using 4 CE levels
PRACH_4CE	Used for RRM testing using reference PRACH Configurations PRACH_4CE in TS 36.521-3 clause A.9

Table 6.2.13.4.3-4: Exceptions in RACH-ConfigCommon-DEFAULT for FDD contention based random access test in enhanced coverage

Derivation Path: 36.508 [7] clause 4.6.3 Table 4.6.3-12			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
RACH-CE-LevelInfo-r13			CEModeB
preambleMappingInfoList-r13 SEQUENCE (SIZE (1..maxCE-Level-r13)) OF PreambleMappingInfo-r13	4 entries		
PreambleMappingInfo-r13[1] SEQUENCE {			
firstPreamble-r13	0		
lastPreamble-r13	9		
}			
PreambleMappingInfo-r13[2] SEQUENCE {			
firstPreamble-r13	10		
lastPreamble-r13	19		
}			
PreambleMappingInfo-r13[3] SEQUENCE {			
firstPreamble-r13	20		
lastPreamble-r13	29		
}			
PreambleMappingInfo-r13[4] SEQUENCE {			
firstPreamble-r13	30		
lastPreamble-r13	39		
}			
}			
rar-HoppingConfigInfoList-r13	Off		
}			
}			

6.2.13.5 Test requirement

Tables 6.2.13.5-1, 6.2.13.5-2 and 6.2.13.5-3 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.13.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.13.4.2, the power of the first preamble shall be -27 dBm to within the accuracy specified in Table 6.2.13.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.13.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.13.5-6.

Table 6.2.13.5-1: General test parameters for FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.22 FDD	As defined in TS 36.133 [4] clause A.3.1.4.4
MPDCCH parameters Note 2		R.18 FDD	As defined in TS 36.133 [4] clause A.3.1.3.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in TS 36.133 [4] clause A.3.1.2.1
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB	0	
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s / N_{oc}$	dB	-12	
$\hat{E}_s / I_{ot}$ Note 3	dB	-12	
RSRP Note 3	dBm/15 KHz	-110	
Io Note 3	dBm/9 MHz	-70	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.
Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.13.5-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.13.5-3: PRACH-Configuration parameters for FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{23, 37, 47}				Corresponding to {-117, -103, -93} dBm as defined in TS36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	23 dBm				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	Sf8	sf16	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.13.5-4: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
±10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.13.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.13.5-5: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.13.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.13.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

CEMode	T_e
B	51*T_S
Note 1: TS 36.133 [4] clauses A.6.2.13.2, 7.24 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.14 E-UTRAN HD-FDD - Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Test tolerances applicable to this test related to rsrp-ThresholdsPrach values for CE levels, RSRP level and UE RSRP accuracy in normal conditions and extreme condition are undefined

6.2.14.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a Cat-M1 UE in Enhanced Coverage is according to the E-UTRAN HD-FDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits, and whether the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.14.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

6.2.14.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

Per TS 36.133 [4] clause 6.2.3, in addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources (TS 36.331 [5]) configured for the corresponding enhanced coverage level as determined in the previous step;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.14.

The test parameters are given in Tables 6.2.14.5-1, 6.2.14.5-2 and 6.2.14.5-3.

6.2.14.4 Test description

6.2.14.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.14.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the Cat-M1 UE.

1. Ensure the CAT-M1 UE is in State 2A-RF-CE

2. Set the parameters according to Tables 6.2.14.5-1, 6.2.14.5-2 and 6.2.14.5-3 as appropriate where CE level 2 shall be used. Propagation conditions are set according to Annex B clause B.1.1.

3. The CAT-M1 UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.

4. Test 1: Correct behaviour when receiving random access response

   4.1. In Test 1, the CAT-M1 UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles (the preamble may be transmitted multiple times in each attempt) have been received by the SS.

   4.4. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.14.5-4 and 6.2.14.5-6. The power of the first preamble shall be -27 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.14.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.14.5-6.

5. Test 2: Correct behaviour when not receiving random access response

   5.1. Repeat step 1-3.

   5.2. In Test 2, the CAT-M1 UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

   5.3. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 80 sub-frames.

   5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   5.5. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

   5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.14.5-4 and 6.2.14.5-6. The power of the first preamble shall be -27 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.14.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.14.5-6.

6. Test 3: Correct behaviour when receiving a NACK on msg3

   6.1. Repeat step 1-3.

   6.2. In Test 3, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   6.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

   6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

   6.5. The CAT-M1 UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

   7.1. Repeat step 1-3.

7.2. In Test 4, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in msg3 uplink message.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.2. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.4. The CAT-M1 UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the CAT-M1 UE shall send the preamble to the SS.

10.3. The CAT-M1 UE shall determines the enhanced coverage level 2 based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36,321 [11].

10.4. The CAT-M1 UE shall selects PRACH resources configured for the corresponding enhanced coverage level 2 as determined in the previous step.

10.5. The CAT-M1 UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 2.

6.2.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.14.4.3-1: Common Exception messages for E-UTRAN HD-FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.6-1 Table H.2.6-2 Table H.2.6-3
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.14.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN HD-FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.14.4.3-3: Exceptions in PRACH-ConfigSIB-v1310-DEFAULT for FDD contention based random access test in enhanced coverage

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7b PRACH-ConfigSIB-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries	Threshold values to determine the CE Level 1, 2 and 3 for PRACH. RSRP-Range values according to mapping table in TS36.133[4] Table 9.1.14.3.3-1.	CEmodeB PRACH_4CE
RSRP-Range[1]	47	-93 dBm	
RSRP-Range[2]	37	-103 dBm	
RSRP-Range[3]	23	-117 dBm	
}			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries	1: CE Level 0 2: CE Level 1 3: CE Level 2 4: CE Level 3	CEModeB PRACH_4CE
prach-ConfigIndex-r13[1]	4		FDD
prach-FreqOffset-r13[1]	0		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n3		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[1]	r8		
prach-HoppingConfig-r13[1]	Off		
prach-ConfigIndex-r13[2]	4		FDD
prach-FreqOffset-r13[2]	0		
prach-StartingSubframe-r13[2]	sf4		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n4		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[2]	r8		
prach-HoppingConfig-r13[2]	Off		
prach-ConfigIndex-r13[3]	4		FDD
prach-FreqOffset-r13[3]	0		
prach-StartingSubframe-r13[3]	sf8		
maxNumPreambleAttemptCE-r13[3]	n7		
numRepetitionPerPreambleAttempt-r13[3]	n16		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[3]	r128		
prach-HoppingConfig-r13[3]	Off		
prach-ConfigIndex-r13[4]	4		FDD
prach-FreqOffset-r13[4]	0		
prach-StartingSubframe-r13[4]	sf16		
maxNumPreambleAttemptCE-r13[4]	n10		
numRepetitionPerPreambleAttempt-r13[4]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[4]	r128		
prach-HoppingConfig-r13[4]	Off		
}			
}			

Condition	Explanation
FDD	FDD cell environment
RF	Used for RF, performance and RRM testing
CEModeB	Used for CE mode B testing using 4 CE levels
PRACH_4CE	Used for RRM testing using reference PRACH Configurations PRACH_4CE in TS 36.521-3 clause A.9

Table 6.2.14.4.3-4: Exceptions in RACH-ConfigCommon-DEFAULT for FDD contention based random access test in enhanced coverage

Derivation Path: 36.508 [7] clause 4.6.3 Table 4.6.3-12			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
RACH-CE-LevelInfo-r13			CEModeB
preambleMappingInfoList-r13 SEQUENCE (SIZE (1..maxCE-Level-r13)) OF PreambleMappingInfo-r13	4 entries		
PreambleMappingInfo-r13[1] SEQUENCE {			
firstPreamble-r13	0		
lastPreamble-r13	9		
}			
PreambleMappingInfo-r13[2] SEQUENCE {			
firstPreamble-r13	10		
lastPreamble-r13	19		
}			
PreambleMappingInfo-r13[3] SEQUENCE {			
firstPreamble-r13	20		
lastPreamble-r13	29		
}			
PreambleMappingInfo-r13[4] SEQUENCE {			
firstPreamble-r13	30		
lastPreamble-r13	39		
}			
}			
rar-HoppingConfigInfoList-r13	Off		
}			
}			

6.2.14.5 Test requirement

Tables 6.2.14.5-1, 6.2.14.5-2 and 6.2.14.5-3 define the primary level settings for E-UTRAN HD-FDD - contention based random access test. Table 6.2.14.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.14.4.2, the power of the first preamble shall be -27 dBm to within the accuracy specified in Table 6.2.14.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.14.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.14.5-6.

Table 6.2.14.5-1: General test parameters for HD-FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.21 FDD	As defined in TS 36.133 [4] clause A.3.2.1.21.
PDSCH parameters Note 2		R.12 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.4.5
MPDCCH parameters Note 2		R.8 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.3.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As defined in TS 36.133 [4] clause A.3.1.2.3
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	-12	
$\hat{E}_s/I_{ot}$ Note 3	dB	-12	
RSRP Note 3	dBm/15 KHz	-110	
Io Note 3	dBm/9 MHz	-70	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.
Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.14.5-2: RACH-Configuration parameters for HD-FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.14.5-3: PRACH-Configuration parameters for HD-FDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{23, 37, 47}				Corresponding to {-117, -103, -93} dBm as defined in TS36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	23 dBm				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	Sf8	sf16	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.14.5-4: Absolute power tolerance for E-UTRAN HD-FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
±10.5 dB	±13.5 dB
Note: TS 36.133 [4] clause A.6.2.14.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.14.5-5: Relative power tolerance for E-UTRAN HD-FDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.14.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.14.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN HD-FDD – Contention Based Random Access test

CEMode	T_e
B	$51*T_S$
Note 1: TS 36.133 [4] clauses A.6.2.14.2, 7.24 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.15 E-UTRAN TDD - Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Test tolerances applicable to this test related to rsrp-ThresholdsPrach values for CE levels, RSRP level and UE RSRP accuracy in normal conditions and extreme condition are undefined

6.2.15.1 Test purpose

The purpose of this test is to verify whether the behaviour of the random access procedure of a Cat-M1 UE in Enhanced Coverage is according to the E-UTRAN TDD contention based random access requirements specified in TS 36.133 [4] Clause 6.2.2, Clause 6.2.3 and Clause 7.24.2 in an AWGN channel model, whether the PRACH power settings and timing are within the specified limits, and whether the UE determines properly the enhanced coverage level based on the RSRP measurement and the configured criterion in RSRP-ThresholdsPrach as defined in TS 36.331 [5].

6.2.15.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support CEModeB.

6.2.15.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in clause 6 of TS 36.213[8] and the control of the RACH transmission is specified in clause 5.1 of TS 36.321[11]. Contention based random access procedures can only be carried out on PCell and PSCell.

The CAT-M1 UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have the accuracy as defined in Table 6.3.5.1.1-1 of TS 36.101 [2]. The relative power applied to additional preambles shall have the accuracy as specified in Table 6.3.5.2.1-1 of TS 36.101 [2].

The CAT-M1 UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached for the random access procedure on PCell or PSCell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE shall stop preamble transmission if maximum number of preamble transmission counter has been reached for the random access procedure on an activated Scell as specified in clause 5.1.4 in TS 36.321 [11].

The CAT-M1 UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321 [11].

The Cat-M1 UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The Cat-M1 UE shall send ACK if the Contention Resolution is successful.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the Cat-M1 UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The Cat-M1 UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

Per TS 36.133 [4] clause 6.2.3, in addition to the requirements defined in TS 36.133 [4] clause 6.2.1 and 6.2.2, the Cat-M1 UE shall also execute the random access procedure defined in clause 5.1 in TS 36.321 [11] using the PRACH configuration contained in *PRACH-ConfigSIB* in TS 36.331 [5]:

- Determine the enhanced coverage level based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36.321 [11];
- Select PRACH resources (TS 36.331 [5]) configured for the corresponding enhanced coverage level as determined in the previous step and;
- Transmits or re- transmits PRACH preamble using the selected PRACH resources and PRACH configuration.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1, 6.2.3, 7.1.2 and A.6.2.15.

The test parameters are given in Tables 6.2.15.5-1, 6.2.15.5-2 and 6.2.15.5-3.

6.2.15.4 Test description

6.2.15.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.15.4.2 Test procedures

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The EUTRAN shall not explicitly signal a Random Access Preamble via dedicated signalling in the downlink to the Cat-M1 UE.

1. Ensure the CAT-M1 UE is in State 2A-RF-CE
2. Set the parameters according to Tables 6.2.15.5-1, 6.2.15.5-2 and 6.2.15.5-3 as appropriate where CE level 2 shall be used. Propagation conditions are set according to Annex B clause B.1.1.
3. The CAT-M1 UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response

    4.1. In Test 1, the CAT-M1 UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

    4.2. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

    4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles (the preamble may be transmitted multiple times in each attempt) have been received by the SS.

    4.4. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

    4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.15.5-4 and 6.2.15.5-6. The power of the first preamble shall be -27 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.15.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.15.5-6.

5. Test 2: Correct behaviour when not receiving random access response

    5.1. Repeat step 1-3.

    5.2. In Test 2, the CAT-M1 UE shall send the preamble to the SS. The SS shall not respond to the first 4 preambles.

    5.3. The CAT-M1 UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if no random access response is received within the RA Response window of 80 sub-frames.

    5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

    5.5. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

    5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.15.5-4 and 6.2.15.5-6. The power of the first preamble shall be -27 dBm. Measure the relative power and timing applied to additional preambles and it shall not exceed the values specified in Table 6.2.15.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.15.5-6.

6. Test 3: Correct behaviour when receiving a NACK on msg3

    6.1. Repeat step 1-3.

    6.2. In Test 3, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

    6.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The CAT-M1 UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in msg3 uplink message.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1. Repeat step 1-3

8.2. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

8.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

8.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.5. The CAT-M1 UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1. Repeat step 1-3.

9.2. In Test 6, the CAT-M1 UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.3. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5. The CAT-M1 UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires.

9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

9.7. The CAT-M1 UE shall consider this random access response reception successful and transmit the msg3.

10. Test 7: PRACH Resource Selection

10.1. Repeat step 1-3.

10.2. In Test 7, the CAT-M1 UE shall send the preamble to the SS.

10.3. The CAT-M1 UE shall determines the enhanced coverage level 2 based on the RSRP measurement and the configured criterion (*RSRP-ThresholdsPrach* in TS 36.331 [5]) as defined in section 5.1.1, TS 36,321 [11].

10.4. The CAT-M1 UE shall selects PRACH resources configured for the corresponding enhanced coverage level 2 as determined in the previous step.

10.5. The CAT-M1 UE shall transmit or re- transmits PRACH preamble using the selected PRACH resources, PRACH configuration and calculated PRACH transmission power for the corresponding coverage level 2.

6.2.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.15.4.3-1: Common Exception messages for E-UTRAN TDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.6-1 Table H.2.6-2 Table H.2.6-3

Table 6.2.15.4.3-2: *UplinkPowerControlCommon-DEFAULT*: Additional E-UTRAN TDD – Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {			
p0-NominalPUSCH	-101 (-101 dBm)		
}			

Table 6.2.15.4.3-3: Exceptions in PRACH-ConfigSIB-v1310-DEFAULT for TDD contention based random access test in enhanced coverage

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7b PRACH-ConfigSIB-v1310-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
rsrp-ThresholdsPrachInfoList-r13 SEQUENCE (SIZE(1..3)) OF {	3 entries	Threshold values to determine the CE Level 1, 2 and 3 for PRACH. RSRP-Range values according to mapping table in TS36.133[4] Table 9.1.14.3.3-1.	CEmodeB PRACH_4CE
RSRP-Range[1]	47	-93 dBm	
RSRP-Range[2]	37	-103 dBm	
RSRP-Range[3]	23	-117 dBm	
}			
prach-ParametersListCE-r13 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF SEQUENCE {	4 entries	1: CE Level 0 2: CE Level 1 3: CE Level 2 4: CE Level 3	CEModeB PRACH_4CE
prach-ConfigIndex-r13[1]	4		TDD
prach-FreqOffset-r13[1]	0		
prach-StartingSubframe-r13[1]	sf2		
maxNumPreambleAttemptCE-r13[1]	n3		
numRepetitionPerPreambleAttempt-r13[1]	n1		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[1]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[1]	r8		
prach-HoppingConfig-r13[1]	Off		
prach-ConfigIndex-r13[2]	4		TDD
prach-FreqOffset-r13[2]	0		
prach-StartingSubframe-r13[2]	sf4		
maxNumPreambleAttemptCE-r13[2]	n5		
numRepetitionPerPreambleAttempt-r13[2]	n4		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[2]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[2]	r8		
prach-HoppingConfig-r13[2]	Off		
prach-ConfigIndex-r13[3]	4		TDD
prach-FreqOffset-r13[3]	0		
prach-StartingSubframe-r13[3]	sf8		
maxNumPreambleAttemptCE-r13[3]	n7		
numRepetitionPerPreambleAttempt-r13[3]	n16		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[3]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[3]	r128		
prach-HoppingConfig-r13[3]	Off		
prach-ConfigIndex-r13[4]	4		TDD
prach-FreqOffset-r13[4]	0		
prach-StartingSubframe-r13[4]	sf16		
maxNumPreambleAttemptCE-r13[4]	n10		
numRepetitionPerPreambleAttempt-r13[4]	n64		
mpdcch-NarrowbandsToMonitor-r13 SEQUENCE (SIZE(1..2)) OF INTEGER (1..maxAvailNarrowBands-r13)[4]	1 entry		
mpdcch-NarrowbandsToMonitor-r13[1]	2		RF
mpdcch-NumRepetition-RA-r13[4]	r128		
prach-HoppingConfig-r13[4]	Off		
}			
}			

Condition	Explanation
TDD	TDD cell environment
RF	Used for RF, performance and RRM testing
CEModeB	Used for CE mode B testing using 4 CE levels
PRACH_4CE	Used for RRM testing using reference PRACH Configurations PRACH_4CE in TS 36.521-3 clause A.9

Table 6.2.15.4.3-4: Exceptions in RACH-ConfigCommon-DEFAULT for TDD contention based random access test in enhanced coverage

Derivation Path: 36.508 [7] clause 4.6.3 Table 4.6.3-12			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
preamblesGroupAConfig SEQUENCE {			
sizeOfRA-PreamblesGroupA	n52		No Group B
}			
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
RACH-CE-LevelInfo-r13			CEModeB
preambleMappingInfoList-r13 SEQUENCE (SIZE (1..maxCE-Level-r13)) OF PreambleMappingInfo-r13	4 entries		
PreambleMappingInfo-r13[1] SEQUENCE {			
firstPreamble-r13	0		
lastPreamble-r13	9		
}			
PreambleMappingInfo-r13[2] SEQUENCE {			
firstPreamble-r13	10		
lastPreamble-r13	19		
}			
PreambleMappingInfo-r13[3] SEQUENCE {			
firstPreamble-r13	20		
lastPreamble-r13	29		
}			
PreambleMappingInfo-r13[4] SEQUENCE {			
firstPreamble-r13	30		
lastPreamble-r13	39		
}			
}			
rar-HoppingConfigInfoList-r13	Off		
}			
}			

6.2.15.5 Test requirement

Tables 6.2.15.5-1, 6.2.15.5-2 and 6.2.15.5-3 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.15.5-6 defines the uplink timing error limit including test tolerances.

For the tests specified in section 6.2.15.4.2, the power of the first preamble shall be -27 dBm to within the accuracy specified in Table 6.2.15.5-4. The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.15.5-5. The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.15.5-6.

Table 6.2.15.5-1: General test parameters for TDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern Note 1		OP.11 TDD	As defined in TS 36.133 [4] clause A.3.2.2.11.
PDSCH parameters Note 2		R.18 TDD	As defined in TS 36.133 [4] clause A.3.1.4.6
MPDCCH parameters Note 2		R.16 TDD	As defined in TS 36.133 [4] clause A.3.1.3.6
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in TS 36.133 [4] clause A.3.1.2.2
Special subframe configuration	-	6	As specified in table 4.2-1 in TS 36.211 [9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in TS 36.211 [9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	-12	
$\hat{E}_s/I_{ot}$ Note 3	dB	-12	
RSRP Note 3	dBm/15 KHz	-110	
Io Note 3	dBm/9 MHz	-70	
Propagation Condition	-	AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.

Note 2: The PDSCH and MPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.

Note 3: Es/Iot, RSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.

Table 6.2.15.5-2: RACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
numberOfRA-Preambles	n52				
sizeOfRA-PreamblesGroupA	n52				No group B.
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
maxHARQ-Msg3Tx	4				
rar-HoppingConfig	Off				
Parameters per CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
ra-ResponseWindowSize (per CE)	sf20	sf80	sf180	sf320	
mac-ContentionResolutionTimer (per CE)	sf80	sf120	sf200	sf480	
PreambleMappingInfo {firstPreamble, lastPreamble}	{0, 9}	{10,19}	{20,29}	{30,39}	
Note: For further information see Clause 6.3.2 in TS 36.331 [5].					

Table 6.2.15.5-3: PRACH-Configuration parameters for TDD contention based random access test

Field	Value				Comment
Parameters not per CE Levels					
rsrp-ThresholdsPrach	{23, 37, 47}				Corresponding to {-117, -103, -93} dBm as defined in TS36.133 [4] clause 9.1.21.5
mpdcch-startSF-CSS-RA	v1				
referenceSignalPower	-5 dBm/15 KHz				As defined in clause 6.3.2 in TS 36.331 [5].
maxHARQ-Msg3Tx	4				As defined in Table 5.7.1-2 in TS 36.211 [9]
Backoff Parameter Index	2				As defined in Table 7.2-1 in TS 36.321 [11]
Configured UE transmitted power (P_{CMAX})	23 dBm				As defined in clause 6.2.5 in TS 36.101 [2]
Parameters per PRACH CE Levels					
CE Level	***Level 0***	***Level 1***	***Level 2***	***Level 3***	
prach-ConfigIndex	4	4	4	4	As defined in Table 5.7.1-2 in TS 36.211 [9]
prach-FreqOffset	0	0	0	0	
prach-StartingSubframe	sf2	sf4	Sf8	sf16	
maxNumPreambleAttempt	n3	n5	n7	n10	
numRepetitionPerPreambleAttempt	n1	n4	n16	n64	
mpdcch-NarrowbandsToMonitor	2	2	2	2	
mpdcch-NumRepetition-RA	r8	r8	r128	r128	
prach-HoppingConfig	Off	Off	Off	Off	
Note 1: See Clause 6.3.2 in TS 36.331 [5] for further information on the parameters in this table.					

Table 6.2.15.5-4: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
±10.5 dB	± 13.5 dB
Note: TS 36.133 [4] clause A.6.2.15.2 and TS 36.101 [2] clause 6.3.5.1.1	

Table 6.2.15.5-5: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

Power Step Size (Up or Down)	PRACH	
	Normal Conditions	**Extreme Conditions**
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: TS 36.133 [4] clause A.6.2.15.2 and TS 36.101 [2] clause 6.3.5.2.1 Note 2: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.15.5-6: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

CEMode	T_e
B	51*T_S
Note 1: TS 36.133 [4] clauses A.6.2.15.2, 7.24 and clause 7.1.2 Note 2: T_S is the basic timing unit defined in TS 36.211 [9]	

6.3 RRC Connection Release with Redirection

6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD

6.3.1.1 Test purpose

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

6.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

6.3.1.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI-UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.1.

6.3.1.4 Test description

6.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 6.3.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.1.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.1.4.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	≤5	
T2	s	1	

6.3.1.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.1.5-1 and 6.3.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.1.5-1 for Cell 1, and Table 6.3.1.5-2 for Cell 2.

6. If the UE transmits the PRACH to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.1.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-FDD-r9	CellInfoListUTRA-FDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.1.4.3-2: *CellInfoListUTRA-FDD-r9*: Additional Redirection from E-UTRAN FDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-FDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.1.5 Test requirement

Tables 6.3.1.4.1-1, 6.3.1.5-1 and 6.3.1.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN FDD test.

Table 6.3.1.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.1.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	-12.81
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or} Note 3: This gives an SCH Ec/Io of -15dB			

The UE shall start to transmit random access to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as

Test Requirement = $T_{RRC\_procedure\_delay}$ + $T_{identify\text{-}UTRA\ FDD}$ + $T_{SI\text{-}UTRA\ FDD}$ + T_{RA}

$T_{RRC\_procedure\_delay}$ = 110 ms

$T_{identify\text{-}UTRA\ FDD}$ = 500 ms

$T_{SI\text{-}UTRA\ FDD}$ =the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD

6.3.2.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements.

6.3.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

6.3.2.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,

- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.2.

6.3.2.4 Test description

6.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.

2. The general test parameter settings are set up according to Table 6.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.2.4.3.

5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.2.4.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN TDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	≤5	
T2	s	1	

6.3.2.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.2.5-1 and 6.3.2.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.2.5-1 for Cell 1, and Table 6.3.2.5-2 for Cell 2.

6. If the UE transmits the PRACH to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.Cell 1 is the active cell.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.2.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN TDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-FDD-r9	CellInfoListUTRA-FDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.2.4.3-2: *CellInfoListUTRA-FDD-r9*: Additional Redirection from E-UTRAN TDD to UTRAN FDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-FDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.2.5 Test requirement

Tables 6.3.2.4.1-1, 6.3.2.5-1 and 6.3.2.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN FDD test.

Table 6.3.2.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.2.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	-12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to transmit random access to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as

Test Requirement = $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms

$T_{identify\text{-}UTRA\ FDD}$ = 500 ms

$T_{SI\text{-}UTRA\ FDD}$ =the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided

6.3.3.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell to meet the RRC connection release with redirection to GERAN requirements.

6.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GERAN.

6.3.3.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.3.

6.3.3.4 Test description

6.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The parameter settings for the cells are set up according to Table 6.3.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.3.4.3.
5. There is one E-UTRA FDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.3.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	GSM cells are provided in the "*RRCConnectionRelease*" message.
T1	s	5	
T2	s	2	

6.3.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.3.5-1 and 6.3.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.3.5-1 for Cell 1, and Table 6.3.3.5-2 for Cell 2.

6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 1120 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.3.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
geran-r9	CellInfoListGERAN-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.3.4.3-2: *CellInfoListGERAN-r9*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListGERAN-r9 ::= SEQUENCE (SIZE (1..6)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
carrierFreq-r9	Cell 2 carrier frequency		
systemInformation-r9	Cell 2 relevant system information		
}			

6.3.3.5 Test requirement

Tables 6.3.3.4.1-1, 6.3.3.5-1 and 6.3.3.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to GERAN test.

Table 6.3.3.5-1: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 6.3.3.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 0; UE does not have to read the system information of the GERAN cell since all relevant SI is provided to the UE in the "RRCConnectionRelease" message.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 1120 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided

6.3.4.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell to meet the RRC connection release with redirection to GERAN requirements.

6.3.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support GERAN.

6.3.4.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.4.

6.3.4.4 Test description

6.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The parameter settings for the cells are set up according to Table 6.3.4.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.4.4.3.

5. There is one E-UTRA TDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.4.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	GSM cells are provided in the "*RRCConnectionRelease*" message.
T1	s	5	
T2	s	2	

6.3.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.4.5-1 and 6.3.4.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.4.5-1 for Cell 1, and Table 6.3.4.5-2 for Cell 2.

6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 1120 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.4.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN TDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
RedirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
geran-r9	CellInfoListGERAN-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.4.4.3-2: *CellInfoListGERAN-r9*: Additional Redirection from E-UTRAN TDD to GERAN test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListGERAN-r9 ::= SEQUENCE (SIZE (1..6)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
carrierFreq-r9	Cell 2 carrier frequency		
systemInformation-r9	Cell 2 relevant system information		
}			

6.3.4.5 Test requirement

Tables 6.3.4.4.1-1, 6.3.4.5-1 and 6.3.4.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to GERAN test.

Table 6.3.4.5-1: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 6.4.3.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct “RRC connection release with redirection to GERAN” observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message “*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 0; UE does not have to read the system information of the GERAN cell since all relevant SI is provided to the UE in the “RRCConnectionRelease” message.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 1120 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD

6.3.5.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD.

6.3.5.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.5.

6.3.5.4 Test description

6.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 6.3.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 6.3.5.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.5.4.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Uplink-downlink configuration of cell 1		1	As specified in table 4.2-2 in TS 36.211.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	5	
T2	s	1	

6.3.5.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.5.5-1 and 6.3.5.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.5.5-1for Cell 1, and Table 6.3.5.5-2 for Cell 2.
6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.5.4.3-1: *RRCConnectionRelease*: E-UTRA TDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-TDD-r9	CellInfoListUTRA-TDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.5.4.3-2: *CellInfoListUTRA-TDD-r9*: E-UTRA TDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-TDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.5.5 Test requirement

Tables 6.3.5.4.1-1, 6.3.5.5-1 and 6.3.5.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN TDD test.

Table 6.3.5.5-1: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.5.5-2: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP [Note3]	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io [Note3]	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms, which is specified in TS 36.133 [4] section 6.3.2.3.

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; which is defined in TS 36.133 [4] section 6.3.2.3.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$ = 0 ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.

T_{RA} = 40ms. This is the additional delay caused by the random access procedure

It gives a total delay of 650 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD

6.3.6.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD.

6.3.6.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.6.

6.3.6.4 Test description

6.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 6.3.6.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 6.3.6.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.6.4.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the "*RRCConnectionRelease*" message from the E-UTRAN
T1	s	5	
T2	s	1	

6.3.6.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.6.5-1 and 6.3.6.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.6.5-1 for Cell 1, and Table 6.3.6.5-2 for Cell 2.
6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.6.4.3-1: *RRCConnectionRelease*: E-UTRA FDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
nonCriticalExtension {			
cellInfoList-r9 CHOICE {			
utra-TDD-r9	CellInfoListUTRA-TDD-r9		
}			
nonCriticalExtension	Not present		
}			
}			
}			
}			
}			

Table 6.3.6.4.3-2: *CellInfoListUTRA-TDD-r9*: E-UTRA FDD RRC connection release redirection to UTRA TDD test requirement (step3)

Derivation Path: TS 36.331 [5] clause 6.6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CellInfoListUTRA-TDD-r9 ::= SEQUENCE (SIZE (1..16)) OF SEQUENCE {			
physCellId-r9	Cell 2 physical cell identity		
utra-BCCH-Container-r9	Cell 2 Relevant System Information		
}			

6.3.6.5 Test requirement

Tables 6.3.6.4.1-1, 6.3.6.5-1 and 6.3.6.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN TDD test.

Table 6.3.6.1-2: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 6.3.6.1-3: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP [Note3]	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io [Note3]	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			

Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms, which is specified in TS 36.133 [4] section 6.3.2.3.

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; which is defined in TS 36.133 [4] section 6.3.2.3.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$ = 0 ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.

T_{RA} = 40ms. This is the additional delay caused by the random access procedure.

This gives a total delay of 650 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

6.3.7.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD.

6.3.7.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.7.

6.3.7.4 Test description

6.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.
2. The general test parameter settings are set up according to Table 6.3.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 6.3.7.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.7.4.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		none	No explicit neighbour list is provided to the UE
T1	s	5	
T2	s	2	

6.3.7.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2. The "*RRCConnectionRelease*" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from Cell 1. The "*RRCConnectionRelease*" message shall not contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.7.5-1 and 6.3.7.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.7.5-1for Cell 1, and Table 6.3.7.5-2 for Cell 2.

6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.7.4.3-1: *RRCConnectionRelease*: E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.7.5 Test requirement

Tables 6.3.7.4.1-1, 6.3.7.5-1 and 6.3.7.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN TDD test without SI provided.

Table 6.3.7.5-1: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.7.5-2: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP [Note3]	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io [Note3]	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms; It is the RRC procedure for processing the received message "*RRCConnectionRelease*".

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; It is the time to identify the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

T_{RA} = 40ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

6.3.8.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$. This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in TS 36.133 [4] section 6.3.2.3.

6.3.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD.

6.3.8.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within $T_{connection\_release\_redirect\_UTRA\ TDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ TDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$$

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io $\geq$ -6 dB,
- DwPCH_Ec/Io $\geq$ -1 dB.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ TDD}$: It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ TDD}$: It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$: It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.3 and A.6.3.8.

6.3.8.4 Test description

6.3.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.
2. The general test parameter settings are set up according to Table 6.3.8.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 6.3.8.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.8.4.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		none	No explicit neighbour list is provided to the UE
T1	S	5	
T2	S	2	

6.3.8.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The "*RRCConnectionRelease*" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall not contain all the relevant system information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.8.5-1 and 6.3.8.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during time period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.8.5-1 for Cell 1 and Table 6.3.8.5-2 for Cell 2.
6. If the UE transmits the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16 for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.8.4.3-1: *RRCConnectionRelease*: E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-TDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.8.5 Test requirement

Tables 6.3.8.4.1-1, 6.3.8.5-1 and 6.3.8.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN TDD test.

Table 6.3.8.5-1: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.8.5-2: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 1			
PCCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP [Note3]	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io [Note3]	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition		AWGN			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ TDD} + N_{redirect\text{-}UTRA\ TDD} + T_{SI\text{-}UTRA\ TDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms; It is the RRC procedure for processing the received message "*RRCConnectionRelease*".

$T_{identify\text{-}UTRA\ TDD}$ = 500 ms; It is the time to identify the target UTRA TDD cell.

$N_{redirect\text{-}UTRA\ TDD}$ = 0. It is the total number of target UTRA TDD frequencies included in RedirectedCarrierInfo in "*RRCConnectionRelease*" message. It can be up to 4 UTRA TDD frequencies.

$T_{SI\text{-}UTRA\ TDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

T_{RA} = 40ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information

6.3.9.1 Test purpose

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell without system information. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

6.3.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

6.3.9.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.1.

6.3.9.4 Test description

6.3.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 6.3.9.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.9.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.9.4.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	≤5	
T2	s	2	

6.3.9.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message not containing any system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. Prior to time duration T2, the UE shall not have any timing information of Cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.9.5-1 and 6.3.9.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.9.5-1 for Cell 1, and Table 6.3.9.5-2 for Cell 2.
6. If the UE transmits the PRACH to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.9.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to UTRAN FDD test requirement without system information (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.9.5 Test requirement

Tables 6.3.9.4.1-1, 6.3.9.5-1 and 6.3.9.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to UTRAN FDD without system information test.

Table 6.3.9.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.9.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to transmit random access to Cell 2 less than 1930 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRAN FDD observed during repeated tests shall be at least 90%.

The overall delays measured test requirement can be expressed as

Test Requirement = $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms

$T_{identify\text{-}UTRA\ FDD}$ = 500 ms

$T_{SI\text{-}UTRA\ FDD}$ =the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 1280 ms is assumed in this test case.

T_{RA} = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 1930 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided

6.3.10.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell when system information is not provided to meet the RRC connection release with redirection to GERAN requirements.

6.3.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GERAN.

6.3.10.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.10.

6.3.10.4 Test description

6.3.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.

2. The parameter settings for the cells are set up according to Table 6.3.10.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.10.4.3.

5. There is one E-UTRA FDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.10.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	Only the list of GERAN carrier frequencies is provided in the "*RRCConnectionRelease*" message.
T1	s	≤5	
T2	s	4	

6.3.10.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall not contain the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.10.5-1 and 6.3.10.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an *RRCConnectionRelease* without the relevant system information of Cell 2 during period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.10.5-1 for Cell 1, and Table 6.3.10.5-2 for Cell 2.

6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 3020 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.10.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.10.5 Test requirement

Tables 6.3.10.4.1-1, 6.3.10.5-1 and 6.3.10.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN FDD to GERAN test.

Table 6.3.10.5-1: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 6.3.10.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 3020 ms from the beginning of time period T2.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 1900 ms; which is the maximum time allowed to read BCCH data from the target GERAN cell.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 3020 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided

6.3.11.1 Test Purpose

To verify that the UE is able to performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell when system information is not provided to meet the RRC connection release with redirection to GERAN requirements.

6.3.11.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support GERAN.

6.3.11.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within $T_{connection\_release\_redirect\_GERAN}$.

The time delay ($T_{connection\_release\_redirect\_GERAN}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ($T_{connection\_release\_redirect\_GERAN}$) shall be less than:

$$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$$

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ GERAN}$: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

$T_{SI\text{-}UTRA\ GERAN}$: It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.2 and A.6.3.11.

6.3.11.4 Test description

6.3.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The parameter settings for the cells are set up according to Table 6.3.11.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.3.11.4.3.

5. There is one E-UTRA TDD cell and one GERAN cell specified in the test. Cell 1(E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.11.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including ARFCN 1	Only the list of GERAN carrier frequencies is provided in the "*RRCConnectionRelease*" message.
T1	s	≤5	
T2	s	4	

6.3.11.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall not contain the relevant system information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.3.11.5-1 and 6.3.11.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during time period T1.

4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.

5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.11.5-1 for Cell 1 and Table 6.3.11.5-2 for Cell 2.

6. If the UE transmits the random access burst on RACH of the target GERAN Cell 2 less than 3020 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Cell 1 is the active cell.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.11.4.3-1: *RRCConnectionRelease*: Additional Redirection from E-UTRAN FDD to GERAN test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
geran	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.11.5 Test requirement

Tables 6.3.11.4.1-1, 6.3.11.5-1 and 6.3.11.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to GERAN test.

Table 6.3.11.5-1: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 6.3.11.5-2: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 3020 ms from the beginning of time period T2.

The overall delays measured test requirement can be expressed as:

$T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\text{-}GERAN} + T_{SI\text{-}GERAN} + T_{RA}$

$T_{RRC\_procedure\_delay}$ = 110 ms, which is the time for processing the received message "*RRCConnectionRelease*.

$T_{identify\text{-}GERAN}$ = 1000 ms, which is the time for identifying the target GERAN cell.

$T_{SI\text{-}GERAN}$ = 1900 ms; which is the maximum time allowed to read BCCH data from the target GERAN cell.

T_{RA} = 10 ms, which is about 2 GSM frames (2*4.65 ms) to account for the GSM timing uncertainty.

This gives a total of 3020 ms for overall delays measured.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided

6.3.12.1 Test purpose

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRAN TDD to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRAN\ FDD}$. This test will partly verify the RRC connection release with redirection to UTRAN FDD requirements.

6.3.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

6.3.12.3 Minimum conformance requirements

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within $T_{connection\_release\_redirect\_UTRA\ FDD}$.

The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" as defined in section 5.3.8 in TS 36.331 [5] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ($T_{connection\_release\_redirect\_UTRA\ FDD}$) shall be less than:

$$T_{connection\_release\_redirect\_UTRA\ FDD} = T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRA\ FDD} + T_{SI\text{-}UTRA\ FDD} + T_{RA}$$

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io $\geq$ -15 dB,
- SCH_Ec/Io $\geq$ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

$T_{RRC\_procedure\_delay}$: It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

$T_{identify\text{-}UTRA\ FDD}$: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

$T_{SI\text{-}UTRA\ FDD}$: It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

T_{RA}: It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

The normative reference for this requirement is TS 36.133 [4] clause 6.3.2.1 and A.6.3.12.

6.3.12.4 Test description

6.3.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.22.
2. The general test parameter settings are set up according to Table 6.3.12.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.3.12.4.3.
5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 6.3.12.4.1-1: General test parameters for E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRAN RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRAN RF channel number 1.
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length		Normal	Applicable to cell 1
UTRAN RF Channel Number		1	One UTRAN TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRAN FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	≤5	
T2	s	2	

6.3.12.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2. The "*RRCConnectionRelease*" message not containing any system information of Cell 2 shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.3.12.5-1 and 6.3.12.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an *RRCConnectionRelease* not containing the relevant system information of Cell 2 during period T1.
4. The SS shall start T2 timer when the last TTI containing the *RRCConnectionRelease* message is sent to the UE.
5. When T2 starts, the SS shall switch the power setting from T1 to T2 as specified in Table 6.3.12.5-1 for Cell 1, and Table 6.3.12.5-2 for Cell 2.
6. If the UE transmits the PRACH to Cell 2 less than 1930 ms from the beginning of time period T2 then the number of successful tests are increased by one. Otherwise, the number of failure tests is increased by one.
7. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.
8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.3.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.3.12.4.3-1: *RRCConnectionRelease*: Additional E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1			
Information Element	**Value/remark**	**Comment**	**Condition**
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
releaseCause	other		
redirectedCarrierInfo CHOICE {			
utra-FDD	Cell 2 Carrier Information		
}			
idleModeMobilityControlInfo	Not present		
nonCriticalExtension SEQUENCE {			
lateNonCriticalExtension	Not present		
}			
}			
}			
}			

6.3.12.5 Test requirement

Tables 6.3.12.4.1-1, 6.3.12.5-1 and 6.3.12.5-2 define the primary level settings including test tolerances for Redirection from E-UTRAN TDD to UTRAN FDD test.

Table 6.3.12.5-1: Cell Specific Test requirement Parameters for cell #1 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.3.12.5-2: Cell Specific Test Parameters for cell #2 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12+TT	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-∞	0.42
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	-∞	-12.81
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: This gives an SCH Ec/Io of -15dB

The UE shall start to send random access to the target UTRAN FDD cell (Cell 2) less than 1930 ms from the beginning of time period T2.

The time delay can be expressed as: $T_{RRC\_procedure\_delay} + T_{identify\text{-}UTRAN\ FDD} + T_{SI\text{-}UTRAN\ FDD} + T_{RA}$, where:

$T_{RRC\_procedure\_delay}$ = 110 ms, which is specified in TS36.133 [4] section 6.3.2.1.

$T_{identify\text{-}UTRAN\ FDD}$ = 500 ms; which is defined in TS36.133 [4] section 6.3.2.1.

$T_{SI\text{-}UTRAN\ FDD}$: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRAN FDD cell. 1280 ms is assumed in this test case.

T_{RA} = 40ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7 Timing and Signalling Characteristics

The timing requirements are applicable for the uplink physical channels and signals specified in TS 36.211 [9] clause 5 (for uplink physical channels) as defined.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3.

7.1 UE Transmit Timing

7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy

7.1.1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.1.1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.1.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The uplink frame transmission takes place $(N_{\text{TA}} + N_{\text{TA offset}}) \times T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

where:

N_{TA} is $0 \leq N_{TA} \leq 20512$

N_{TA_Ref} is 0 for PRACH; $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. N_{TA_Ref} $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is not changed until next timing advance is received.

$N_{TA\ offset}$ is 0 for frame structure type 1 as defined in TS 36.211 [9] clause 8.1.T_S denotes the basic time unit. The size of various fields in the time domain is expressed as a number of time units T_S = 1/(15000 x 2048) seconds.

Table 7.1.1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in TS 36.133 [4] clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds ±T_e the UE is required to adjust its timing to within ±T_e. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q.

2) The minimum aggregate adjustment rate shall be 7 * × T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.1.3-2.

Table 7.1.1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.1.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.1.4 Test description

7.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 µs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of +128× T_S (approximately +4 µs) for 1.4MHz downlink bandwidth (Test 3) compared to that in step 5. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1.5-4, with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1.5-4 For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used..

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 1-10 for each sub-test in Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 as appropriate.

7.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.1.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.1.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 and bw7 for Test 3	
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and Test 3 and sc3 for Test 2	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.1.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 0 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.1.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.1.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.1.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.1.5 Test requirement

Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.1.5-4, 7.1.1.5-5 and 7.1.1.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
DRX cycle	ms	OFF	80[Note5]	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	R.6 FDD	R.8 FDD
OCNG Pattern[Note2]		OP.2 FDD	OP.2 FDD	OP.4 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see section A.2.1.
Note 2: For the OCNG pattern, see section D.1.2.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.1.5-3.

Table 7.1.1.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test 1	Test 2	Test 3	Comment
	Value			
srs-BandwidthConfig	bw5	bw5	bw7	
srs-SubframeConfig	sc1	sc3	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPts	N/A	N/A	N/A	Not applicable for FDD
srs-Bandwidth	0	0	0	No hopping
srs-HoppingBandwidth	hbw0	hbw0	hbw0	
freqDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
srs-ConfigIndex	0	77	0	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

Table 7.1.1.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The UE transmit timing offset shall be within the requirements in Table 7.1.1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$.

Table 7.1.1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	27*T_S
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1 and 3, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.1.5-5

2) For test 1, the minimum aggregate adjustment rate shall be 3.4 × T_S per 1.002 s.

3) For tests 1 and 3, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.1.5-6.

Table 7.1.1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_q
1.4	18*Ts
≥10	4*Ts
Note: Ts is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.1.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
1.4	18.6*Ts
≥10	4.6*Ts
Note: Ts is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.1.5-1.

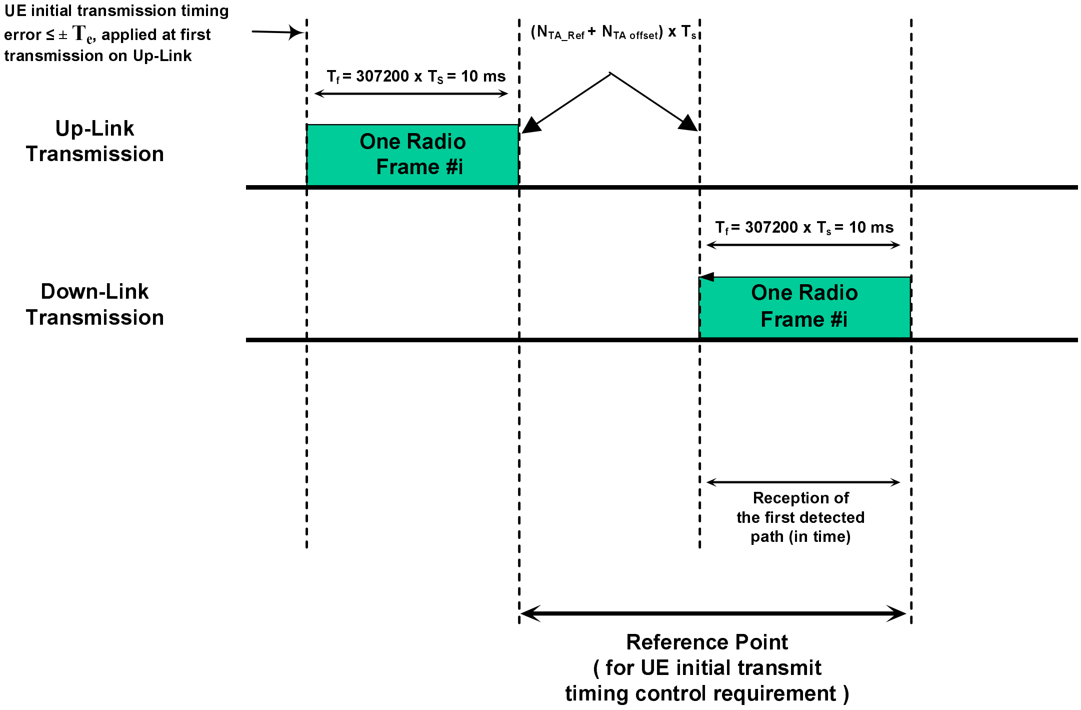

Figure 7.1.1.5-1: Illustration of measurement principle

7.1.1_1 E-UTRAN FDD - UE Transmit Timing Accuracy (Non DRx UE)

7.1.1_1.1 Test purpose

Same test purpose as in clause 7.1.1.1

7.1.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD release 8 UE's not supporting FGI bit 5.

7.1.1_1.3 Minimum conformance requirements

Same minimum conformance requirement as 7.1.1.3

7.1.1_1.4 Test description

7.1.1_1.4.1 Initial conditions

Same initial condition as in clause 7.1.1.4.1

7.1.1_1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1 or Test 3 in Tables 7.1.1_1.5-1 and 7.1.1_1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.1_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 µs) for ≥3 MHz downlink bandwidth (Test 1) and a delay of $+128\times T_S$ (approximately +4 µs) for 1.4MHz downlink bandwidth (Test 3) compared to that in step 5.
7. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.1_1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1_1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.1_1.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.1_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
11. Repeat step 1-10 for each sub-test in Tables 7.1.1_1.5-1 and 7.1.1_1.5-2 as appropriate.

7.1.1_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with exceptions listed in Tables 7.1.1.4.3-1, 7.1.1.4.3-2, 7.1.1.4.3-6, and 7.1.1.4.3-7 of section 7.1.1.4.3 and the following:

Table 7.1.1_1.4.3-1: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and bw7 for Test 3	
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.1_1.4.3-2: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
Duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

7.1.1_1.5 Test requirement

Tables 7.1.1_1.5-1 and 7.1.1_1.5-2 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.1_1.5-3, 7.1.1_1.5-4 and 7.1.1_1.5-5 define the rules for adjustments made to the UE uplink timing including Test Tolerances.

Table 7.1.1_1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	N/A	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	N/A	1.4
DRX cycle	ms	OFF	N/A	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	N/A	R.8 FDD
OCNG Pattern[Note2]		OP.2 FDD	N/A	OP.4 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA[Note3] OCNG_RB[Note3]	dB	0	N/A	0
N_{oc}	dBm/15 kHz	-98	N/A	-98
$\hat{E}_s/I_{ot}$	dB	3.30	N/A	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	N/A	3.30
Io[Note4]	dBm/9 MHz	-65.25	N/A	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	N/A	AWGN
Note 1: For the reference measurement channels, see section A.2.1. Note 2: For the OCNG pattern, see section D.1.2. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.				

Table 7.1.1_1.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test 1	Test 2	Test 3	Comment
	Value			
srs-BandwidthConfig	bw5	N/A	bw7	
srs-SubframeConfig	sc1	N/A	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	N/A	FALSE	
srsMaxUpPts	N/A	N/A	N/A	Not applicable for FDD
srs-Bandwidth	0	N/A	0	No hopping
srs-HoppingBandwidth	hbw0	N/A	hbw0	
freqDomainPosition	0	N/A	0	
Duration	TRUE	N/A	TRUE	Indefinite duration
srs-ConfigIndex	0	N/A	0	SRS periodicity of 2ms for Test 1 and Test 3, respectively.
transmissionComb	0	N/A	0	
cyclicShift	cs0	N/A	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

The UE transmit timing offset shall be within the requirements in Table 7.1.1_1.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.1_1.5-3: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	27*T_S
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.1_1.5-4.

2) For test 1, the minimum aggregate adjustment rate shall be 3.4 × T_S per second.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.1_1.5-5.

Table 7.1.1_1.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	18*T_S
≥10	4*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.1_1.5-5: Test requirement for maximum aggregate adjustment rate per 200 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 200 ms
1.4	18.6*T_S
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.1.5-1 in section 7.1.1.5.

7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy

7.1.2.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.1.2.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e as defined in table 7.1.2-1 of TS 36.133 [4] clause 7.1.2. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The uplink frame transmission takes place $(N_{\text{TA}} + N_{\text{TA offset}}) \times T_s$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

where:

N_{TA} is $0 \leq N_{TA} \leq 20512$

N_{TA_Ref} is 0 for PRACH; N $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. N_{TA_Ref} in T_s units) for other channels is not changed until next timing advance is received.

$N_{TA\ offset}$ is 624 for frame structure type 2 as defined in TS 36.211 [9] clause 8.1. T_S denotes the basic time unit. The size of various fields in the time domain is expressed as a number of time units T_S = 1/(15000 x 2048) seconds.

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in TS 36.133 [4] clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing.

All adjustments made to the UE uplink timing $(N_{\text{TA}} + N_{\text{TA offset}}) \times T_s$ shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q

2) The minimum aggregate adjustment rate shall be $7 \times T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum timing error value T_e is specified in table 7.1.2.3-1 and maximum autonomous time adjustment step T_q is specified in table 7.1.2.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.2.

Table 7.1.2.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

Table 7.1.2.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.2.4 Test description

7.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.2.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.2.5-1 and 7.1.2.5-2 and 7.1.2.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is 624× T_S to within the T_e limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 µs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of +128× T_S (approximately +4 µs) for 1.4MHz downlink (Test 3) bandwidth compared to that in step 5. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.2.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.2.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.2.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offset is ($624 \times T_S$) to within the limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays at $624\times T_S$ to within the T_e limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.2.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 1-10 for each sub-test in Tables 7.1.2.5-1, 7.1.2.5-2 and 7.1.2.5-3 as appropriate.

7.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.2.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.2.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.2.4.3-3: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [5] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 , bw7 for Test 3	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.2.4.3-4: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1, Test3 and 85 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.2.4.4-5: MAC-MainConfig-RBC: Additional UE transmit timing for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	1		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.2.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.2.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.2.5 Test requirement

Tables 7.1.2.5-1, 7.1.2.5-2 and 7.1.2.5-3 define the primary settings including test tolerances for UE transmit timing for E-UTRAN TDD test.

Tables 7.1.2.5-4, 7.1.2.5-5 and 7.1.2.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.2.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
Special subframe configuration^{Note1}		6	6	6
Uplink-downlink configuration^{Note2}		1	1	1
DRX cycle	ms	OFF	80^{Note7}	OFF
PDCCH/PCFICH/PHICH Reference measurement channel^{Note3}		R.6 TDD	R.6 TDD	R.8 TDD
OCNG Pattern^{Note4}		OP.2 TDD	OP.2 TDD	OP.4 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA^{Note5}				
OCNG_RB^{Note5}				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30
Io^{Note6}	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN
Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9] Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9] Note 3: For the reference measurement channels, see section A.2.2. Note 4 For the OCNG pattern, see section D.2.2(for 10MHz) and D.2.4(for 1.4MHz). Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 7: DRX related parameters are defined in Table 7.1.2.5-3.				

Table 7.1.2.5-2: Sounding Reference Signal Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Test 3	Comment
	Value			
srsBandwidthConfiguration	bw5	bw5	bw7	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

Table 7.1.2.5-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The UE transmit timing offset shall be within the requirements in Table 7.1.2.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ seconds.

Table 7.1.2.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	27*T_S
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1 and 3, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.2.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1 and 3, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.2.5-6.

Table 7.1.2.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	18*Ts
≥10	4*Ts
Note: Ts is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.2.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
1.4	18.6*Ts
≥10	4.6*Ts
Note: Ts is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.2.5-4.

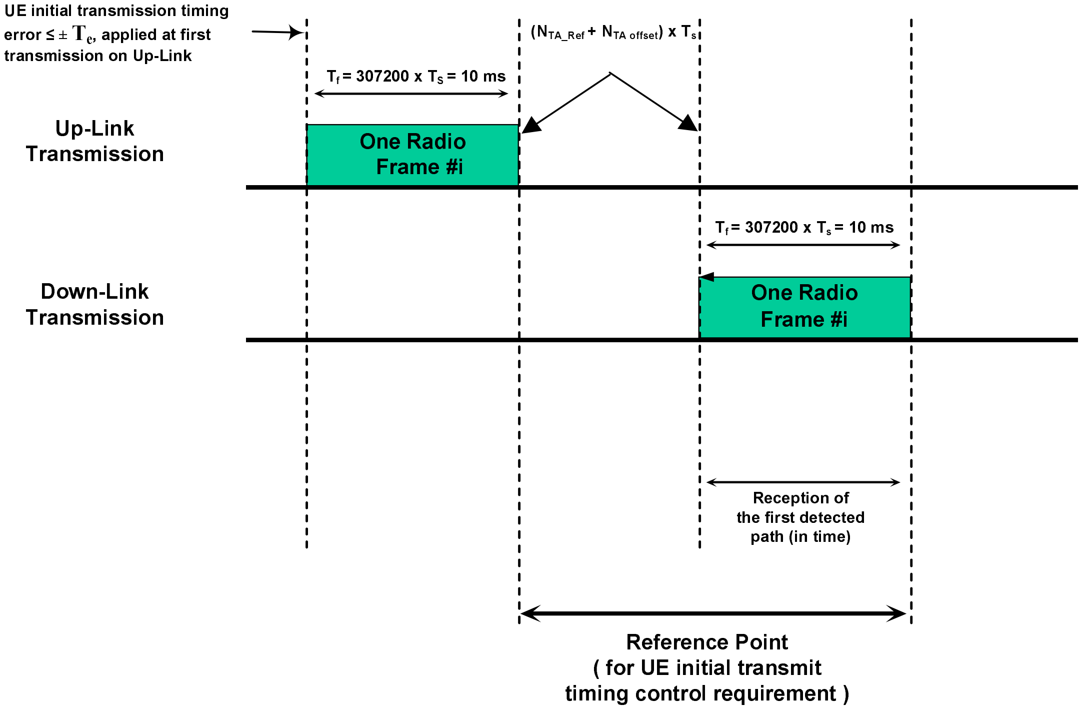

Figure 7.1.2.5-4: Illustration of measurement principle

7.1.2_1 E-UTRAN TDD - UE Transmit Timing Accuracy (Non DRx UE)

7.1.2_1.1 Test purpose

Same test purpose as 7.1.2.1

7.1.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD release 8 UE's not supporting FGI bit 5.

7.1.2_1.3 Minimum conformance requirements

Same minimum conformance requirement as 7.1.2.3

7.1.2_1.4 Test description

7.1.2_1.4.1 Initial conditions

Same initial condition as 7.1.2.4.1

7.1.2_1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1 or Test 3 in Tables 7.1.2_1.5-1 and 7.1.2_1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is $624\times T_S$ to within the T_e limits specified in Table 7.1.2_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 µs) for ≥3 MHz downlink bandwidth (Test 1) and a delay of $+128\times T_S$ (approximately +4 µs) for 1.4MHz downlink (Test 3) bandwidth compared to that in step 5.
7. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.2_1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.2_1.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.2_1.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offset is $(624 \times T_S)$ to within the limits specified in Table 7.1.2_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. The SS shall check that the UE transmit timing offset stays at $624\times T_S$ to within the T_e limits specified in Table 7.1.2_1.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
11. Repeat step 1-10 for each sub-test in Tables 7.1.2_1.5-1 and 7.1.2_1.5-2 as appropriate.

7.1.2_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with exceptions listed in Tables 7.1.2.4.3-1, 7.1.2.4.3-2, 7.1.2.4.3-6, and 7.1.2.4.3-7 of section 7.1.2.4.3 and the following

Table 7.1.2_1.4.3-1: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1, bw7 for Test 3	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.2_1.4.3-2: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

7.1.2_1.5 Test requirement

Tables 7.1.2_1.5-1 and 7.1.2_1.5-2 define the primary settings including test tolerances for UE transmit timing for E-UTRAN TDD test.

Tables 7.1.2_1.5-3, 7.1.2_1.5-4 and 7.1.2_1.5-5 define the rules for adjustments made to the UE uplink timing including Test Tolerances.

Table 7.1.2_1.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	N/A	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	N/A	1.4
Special subframe configuration[Note1]		6	N/A	6
Uplink-downlink configuration[Note2]		1	N/A	1
DRX cycle	ms	OFF	N/A	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	N/A	R.8 TDD
OCNG Pattern[Note4]		OP.2 TDD	N/A	OP.4 TDD
PBCH_RA	dB	0	N/A	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	N/A	-98
$\hat{E}_s/I_{ot}$	dB	3.30	N/A	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	N/A	3.30
Io[Note6]	dBm/9 MHz	-65.25	N/A	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	N/A	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9]
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9]
Note 3: For the reference measurement channels, see section A.2.2.
Note 4 For the OCNG pattern, see section D.2.2(for 10MHz) and D.2.4(for 1.4MHz).
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.

Table 7.1.2_1.5-2: Sounding Reference Signal Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Test3	Comment
	Value			
srsBandwidthConfiguration	bw5	N/A	bw7	
srsSubframeConfiguration	sc3	N/A	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	N/A	FALSE	
srsMaxUpPTS	FALSE	N/A	FALSE	
srsBandwidth	0	N/A	0	No hopping
srsHoppingBandwidth	hbw0	N/A	hbw0	
frequencyDomainPosition	0	N/A	0	
duration	TRUE	N/A	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	N/A	15	SRS periodicity of 10 ms for Test 1 and Test 3, respectively.
transmissionComb	0	N/A	0	
cyclicShift	cs0	N/A	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

The UE transmit timing offset shall be within the requirements in Table 7.1.2_1.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ seconds.

Table 7.1.2_1.5-3: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	27*T_S
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.2_1.5-4.

2) For test 1, the minimum aggregate adjustment rate shall be 3.4 × T_S per 1.01 s.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.2_1.5-5.

Table 7.1.2_1.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	18*T_S
≥10	4*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.2_1.5-5: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
1.4	18.6*T_S
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.2.5-4 in section 7.1.2.5.

7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell

7.1.3.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.3.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.3.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211.	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.3.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.3.

7.1.3.4 Test description

7.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.3.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.3.5-1, 7.1.3.5-2 and 7.1.3.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of $+64 \times T_S$ (approximately +2 μs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.3.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.3.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.3.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of PCell (Cell 1) is changed is used..

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.3.5-1, 7.1.3.5-2 and 7.1.3.5-3 as appropriate.

7.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.3.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.3.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.3.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.3.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.3.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.3.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.3.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.3.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.3.5 Test requirement

Tables 7.1.3.5-1, 7.1.3.5-2 and 7.1.3.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.3.5-4, 7.1.3.5-5 and 7.1.3.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.3.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG
DRX cycle	ms	OFF	80[Note5]	OFF	80[Note5]
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD
OCNG Pattern[Note2]		OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note4]	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.2.1.
Note 2: For the OCNG pattern, see clause D.1.12.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.3.5-3.

Table 7.1.3.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc1	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	0	77	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.3.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN FDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].			

The UE transmit timing offset shall be within the requirements in Table 7.1.3.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_{\mathrm{s}}$.

Table 7.1.3.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	15*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.3.5-5

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.

3) For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.3.5-6.

Table 7.1.3.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.3.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Rel-12 and forward)

7.1.3_1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.3_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.3_1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.3_1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211.	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds ±T_e the UE is required to adjust its timing to within ±T_e. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.
2. The minimum aggregate adjustment rate shall be 7*T_S per second.
3. The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.3_1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_q
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.3.

7.1.3_1.4 Test description

7.1.3_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.3_1.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1, Test 2 and Test 3 in Tables 7.1.3_1.5-1, 7.1.3_1.5-2 and 7.1.3_1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of $+64 \times T_S$ (approximately +2 µs) (for Test 1 and Test 2) or $+32 \times T_S$ (for Test 3) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period. For Test 3, the downlink timing adjustment shall be done at (320 ± 15) ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.3_1.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.3.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.3_1.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are within the limits specified in Table 7.1.3_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.3_1.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of PCell (Cell 1) is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.3_1.5-1, 7.1.3_1.5-2 and 7.1.3_1.5-3 as appropriate.

7.1.3_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.3_1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.3_1.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.3_1.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.3_1.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.3_1.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1, 77 for Test 2 and 317 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.3_1.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0	Test 2	
sf640	0	Test 3	
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.3_1.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.3_1.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.3_1.5 Test requirement

Tables 7.1.3_1.5-1, 7.1.3_1.5-2 and 7.1.3_1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.3_1.5-4, 7.1.3_1.5-5 and 7.1.3_1.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.3_1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Cell 1			Cell 2		
		Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1	2	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20	20	20
Active PCell		Cell 1	Cell 1	Cell 1			
Active SCell					Cell 2	Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG	pTAG	pTAG
DRX cycle	ms	N/A	80Note5	640Note5	N/A	80Note5	640Note5
PDCCH/PCFICH/PHICH Reference measurement channelNote1		R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD	R.10 FDD
OCNG PatternNote2		OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD	OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RANote3 OCNG_RBNote3	dB	0	0	0	0	0	0
N_{oc}	dBm/15 kHz	-98	-98	-98	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
IoNote4	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.2.1.
Note 2: For the OCNG pattern, see clause D.1.12.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.3_1.5-3.

Table 7.1.3_1.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Cell 1			Cell 2			Comment
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	

srsBandwidthConfiguration	bw5	bw5	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	sc1	sc3	sc3	
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].							

Table 7.1.3_1.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN FDD

Field	Test 2		Test 3		Comment
	Cell 1	Cell 2	Cell 1	Cell 2	
onDurationTimer	psf1	psf1	psf1	psf1	
drx-InactivityTimer	psf1	psf1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	Sf640	Sf640	
shortDRX	disable	disable	disable	Disable	
NOTE: For further information see clause 6.3.2 in TS 36.331 [5].					

The UE transmit timing offset shall be within the requirements in Table 7.1.3_1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}})\times T_s$.

Table 7.1.3_1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_e
≥3	15*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1. For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.3_1.5-5
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.
3. For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.3_1.5-6.

Table 7.1.3_1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.3_1.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell

7.1.4.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.4.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.4.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: TS is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds ±T_e the UE is required to adjust its timing to within ±T_e. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.4.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: TS is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.4

7.1.4.4 Test description

7.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.4.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.4.5-1, 7.1.4.5-2 and 7.1.4.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are 624× T_S to within the T_e limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of +64 × T_S (approximately +2 μs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.
10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as

specified in clause 7.1.4.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.4.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.4.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are ($624 \times T_S$) to within the limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay at ($624 \times T_S$) to within the T_e limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.4.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 1-13 for each sub-test in Tables 7.1.4.5-1, 7.1.4.5-2 and 7.1.4.5-3 as appropriate.

7.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.4.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.4.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.4.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.4.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3	Once every 5 subframes	TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not present		
}			

Table 7.1.4.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	Set according to specific test; 15 for Test 1 and 85 for Test 2	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.4.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.4.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.4.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.4.5 Test requirement

Tables 7.1.4.5-1, 7.1.4.5-2 and 7.1.4.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.4.5-4, 7.1.4.5-5 and 7.1.4.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.4.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20
E-UTRA RF Channel Number		1	1	2	2
Active PCell		Cell 1	Cell 1		
Active Scell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG
Special subframe configuration[Note1]		6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF	80[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD
OCNG Pattern[Note4]		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
PBCH_RA	dB	0	0	0	0
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA[Note5] OCNG_RB[Note5]		0	0		0
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s / I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s / N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note6]	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.8.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.4.5-3.

Table 7.1.4.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	Tset3
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.4.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

The UE transmit timing offset shall be within the requirements in Table 7.1.4.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_s$.

Table 7.1.4.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.4.5-5

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.4.5-6.

Table 7.1.4.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.4.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Rel-12 and forward)

7.1.4_1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.4_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.4_1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\mathrm{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\mathrm{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.4_1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: TS is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.
2. The minimum aggregate adjustment rate shall be $7*T_S$ per second.
3. The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.4_1.3-2.

Table 7.1.4_1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: TS is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.4

7.1.4_1.4 Test description

7.1.4_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.4_1.4.2 Test procedure

The test consists of two cells, PCell and SCell. The transmit timing accuracy is verified related to the downlink frame timing of PCell (Cell 1). The downlink timing of Cell 1 is changed and the changes in UE transmit timing of both PCell and SCell are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1, Test 2 and Test 3 in Tables 7.1.4_1.5-1, 7.1.4_1.5-2 and 7.1.4_1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of both PCell and SCell are 624× T_S to within the T_e limits specified in Table 7.1.4.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).
9. The SS adjusts the downlink timing for PCell (Cell 1) to a delay of +64 × T_S (approximately +2 µs) (for Test 1 and Test 2) or +32×T_S (for Test 3) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period. For Test 3, the downlink timing adjustment shall be done at (320 ± 15) ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.4.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.4.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.4_1.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of both PCell and SCell are ($624 \times T_S$) to within the limits specified in Table 7.1.4_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay at ($624 \times T_S$) to within the T_e limits specified in Table 7.1.4_1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of PCell (Cell 1). In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offsets of both PCell and SCell stay within the limits specified in Table 7.1.4_1.5-4. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.4_1.5-1, 7.1.4_1.5-2 and 7.1.4_1.5-3 as appropriate.

7.1.4_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.4_1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.4_1.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.4_1.4.3-3: *PhysicalConfigDedicated- DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT with condition RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			

Table 7.1.4_1.4.3-4: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3	Once every 5 subframes	TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not present		
}			

Table 7.1.4_1.4.3-5: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	Set according to specific test; 15 for Test 1, 85 for Test 2 and 325 for Test 3	SRS periodicity of 10, 80 ms and 320ms for Test 1, 2 and 3,, respectively.	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.4_1.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0	Test 2	
Sf640	0	Test 3	
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.4_1.4.3-7: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.4_1.4.3-8: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.4_1.5 Test requirement

Tables 7.1.4_1.5-1, 7.1.4_1.5-2 and 7.1.4_1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.4_1.5-4, 7.1.4_1.5-5 and 7.1.4_1.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.4_1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD test case

Parameter	Unit	Cell 1			Cell 2		
		Test 1	Test 2	Test 3	Test 1	Test 2	Test 3

E-UTRA RF Channel Number		1	1	1	2	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20	20	20
E-UTRA RF Channel Number		1	1	1	2	2	2
Active PCell		Cell 1	Cell 1	Cell 1			
Active SCell					Cell 2	Cell 2	Cell 2
TAG configuration		pTAG	pTAG	pTAG	pTAG	pTAG	pTAG
Special subframe configuration[Note1]		6	6	6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1	1	1
DRX cycle	ms	OFF	80[Note7]	640[Note7]	OFF	80[Note7]	640[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD
OCNG Pattern[Note4]		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
PBCH_RA	dB	0	0	0	0	0	0
PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA[Note5] OCNG_RB[Note5]		0	0	0		0	0
N_{oc}	dBm/15 kHz	-98	-98	-98	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30	3.30	3.30	3.30
Io[Note6]	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24	-62.24	-62.24
Propagation condition	-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.8.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.4_1.5-3.

Table 7.1.4_1.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD test case

Field		Cell 1			Cell 2			Comment	
	Test 1	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	Tset3	Tset3

srsBandwidthConfiguration	bw5	bw5	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	325	15	85	325	SRS periodicity of 10, 80 ms and 320ms for Test 1, 2 and 3, respectively.
transmissionComb	0	0	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].							

Table 7.1.4_1.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 and Test 3 for E-UTRAN TDD

Field	Test 2		Test 3		Comment
	Cell 1	Cell 2	Cell 1	Cell 2	
onDurationTimer	psf1	psf1	psf1	psf1	
drx-InactivityTimer	psf1	psf1	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	Sf640	Sf640	
shortDRX	disable	disable	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

The UE transmit timing offset shall be within the requirements in Table 7.1.4_1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$.

Table 7.1.4_1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	15^*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1. For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.4_1.5-5.
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.
3. For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.4_1.5-6.

Table 7.1.4_1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.4_1.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	$4.6*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth

7.1.4A.1 Test purpose

Same test purpose as defined in clause 7.1.4.1.

7.1.4A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.4A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.4.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.4A.

7.1.4A.4 Test description

7.1.4A.4.1 Initial conditions

- Same initial conditions as in clause 7.1.4.4.1 with the following exceptions: Channel Bandwidth to be tested: 20 MHz for Cell 1 on the PCC, 10MHz for Cell 2 on the SCC

7.1.4A.4.2 Test procedure

Same test procedure as in clause 7.1.4.4.2

7.1.4A.4.3 Message contents

Same message contents as in clause 7.1.4.4.3

7.1.4A.5 Test requirement

Table 7.1.4A.5-1, 7.1.4A.5-2 and 7.1.4A.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test. The listed parameter values in Tables 7.1.4A.5-1 will replace the values of corresponding parameters in Table 7.1.4.5-1.

Table 7.1.4A.5-4, 7.1.4A.5-5 and 7.1.4A.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.4A.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD for 20 MHz +10 MHz

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	10	10
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.10 TDD	R.10 TDD	R.6 TDD	R.6 TDD
OCNG Pattern[Note4]		OP.8 TDD	OP.8 TDD	OP.2 TDD	OP.2 TDD
Io[Note6]	dBm/18 MHz	-62.24	-62.24	N/A	N/A
	dBm/9 MHz	N/A	N/A	-65.25	-65.25

Table 7.1.4A.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD test case for 20 MHz +10 MHz

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	Tset3
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.4A.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD for 20 MHz +10 MHz

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

The UE transmit timing offset shall be within the requirements in Table 7.1.4A.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.4A.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_{e}
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) For tests 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.4A.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3) For tests 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.4A.5-6.

Table 7.1.4A.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_{q}
≥10	4*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.4A.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth

7.1.5.1 Test purpose

Same test purpose as defined in clause 7.1.1.1.

7.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support band 31.

7.1.5.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.1.1.3 with the following exceptions:

- Instead of A.7.1.1 → use A.7.1.5.

7.1.5.4 Test description

7.1.5.4.1 Initial conditions

Same initial conditions as defined in 7.1.1.4.1 except that the Channel Bandwidth to be tested is 5MHz as defined in TS 36.508 [7] clause 4.3.1.

7.1.5.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Test 1 in Tables 7.1.5.5-1 and 7.1.5.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.5.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 µs).
7. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.5.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.5.5, the SS shall measure the change in SRS transmission timing over a 1.572s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.5.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.5.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
8. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.5.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

7.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.5.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.5.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.5.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc1		
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.1.5.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	0		
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.5.4.3-5: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30	This IE should be omitted for test 3	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.5.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.5.5 Test requirement

Tables 7.1.5.5-1 and 7.1.5.5-2 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.5.5-3, 7.1.5.5-4 and 7.1.5.5-5 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.5.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case for 5MHz bandwidth

Parameter	**Unit**	**Value**
		Test 1
Channel Bandwidth ($BW_{channel}$)	MHz	5
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.11 FDD
OCNG Pattern[Note2]		OP.16 FDD
Io[Note4]	dBm/4.5 MHz	-68.27
Note 1: For the reference measurement channels, see clause A.2.1. Note 2: For the OCNG pattern, see clause D.1.16. Note 3: See Table 7.1.1.5-1 for the other parameters. Note 4: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.		

Table 7.1.5.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case for 5MHz bandwidth

Field	Test 1	Comment
	Value	
srs-BandwidthConfig	bw5	
srs-SubframeConfig	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	
srsMaxUpPts	N/A	Not applicable for FDD
srs-Bandwidth	0	No hopping
srs-HoppingBandwidth	hbw0	
freqDomainPosition	0	
duration	TRUE	Indefinite duration
srs-ConfigIndex	0	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift

The UE transmit timing offset shall be within the requirements in Table 7.1.5.5-3.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$.

Table 7.1.5.5-3: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.5.5-4

2) The minimum aggregate adjustment rate shall be 5.7 × T_S per 1.572 s.

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.5.5-5.

Table 7.1.5.5-4: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
5	6.0*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.5.5-5: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
5	6.6*Ts
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure

7.1.6 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell in sTAG

7.1.6.1 Test purpose

To verify that the UE is capable of following the frame timing change of the connected System simulator and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits for SCell in sTAG based on the requirements.

7.1.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances and support of FGI bit 5.

7.1.6.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.6.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.6.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$24*T_S$
≥3	$12*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$, as long as, for the UE configured with a pTAG and an sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment. If the transmission timing difference is bigger than the maximum transmission timing difference (i.e., 32.47us) UE may stop adjustment. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.6.3-2.

Table 7.1.6.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$17.5*T_S$
3	$9.5*T_S$
5	$5.5*T_S$
≥10	$3.5*T_S$
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.6.

7.1.6.4 Test description

7.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.6.4.2 Test procedure

The test consists of two cells, PCell and SCell. PCell and SCell are in the Primary Timing Advance Group (pTAG) and the secondary Timing Advance Group (sTAG) respectively. The transmit timing accuracy is verified related to the downlink frame timing of SCell (Cell 2) in sTAG. The downlink timing of Cell 2 is changed and the change in UE transmit timing of SCell is observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.6.5-1, 7.1.6.5-2 and 7.1.6.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of SCell in sTAG are within the limit specified in Table 7.1.6.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).
9. The SS adjusts the downlink transmit timing for the activated SCell (Cell 2) to a delay of $+64 \times T_S$ (approximately +2 µs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.
10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.6.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.6.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.6.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offsets of SCell are within the limit specified in Table 7.1.6.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of the SCell in sTAG stay within the limit specified in Table 7.1.6.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2). In case for Test 2, the SS shall check that the UE transmit timing offsets of the activated SCell (Cell 2) stay within the limit specified in Table 7.1.6.5-4 with respect to the first timing adjustment after downlink frame of the activated SCell (Cell 2) is changed. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of the activated SCell (Cell 2) is changed is used.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 1-13 for each sub-test in Tables 7.1.6.5-1, 7.1.6.5-2 and 7.1.6.5-3 as appropriate.

7.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.6.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD UE transmit timing accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table 7.1.6.4.3-2: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement for Test 1

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.1.6.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.1.6.4.3-4: *SCellToAddMod-r10:* Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.1.6.4.3-5: *RadioResourceConfigCommonSCell-r10:* Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.1.6.4.3-6: *RadioResourceConfigDedicatedSCell-r10:* Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.1.6.4.3-7: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and 85 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.1.6.5 Test requirement

Tables 7.1.6.5-1, 7.1.6.5-2 and 7.1.6.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN FDD test.

Tables 7.1.6.5-4, 7.1.6.5-5 and 7.1.6.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.6.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for E-UTRAN FDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10	10
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	sTAG	sTAG
DRX cycle	ms	OFF	80[Note5]	OFF	80[Note5]
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	R.6 FDD	R.6 FDD	R.6 FDD
OCNG Pattern[Note2]		OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25	-65.25
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.2.1.
Note 2: For the OCNG pattern, see clause D.1.2.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.6.5-3.

Table 7.1.6.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for E-UTRAN FDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.6.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for E-UTRAN FDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.6.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.6.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.6.5-5.

2) For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.002 s.

3) For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.6.5-6.

Table 7.1.6.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.6.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG

7.1.7.1 Test purpose

To verify that the UE is capable of following the frame timing change of the connected System simulator and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits for SCell in sTAG based on the requirements.

7.1.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation. Applicability requires support for FGI bit 5.

7.1.7.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is specified in Table 7.1.7.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.7.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds ±T_e the UE is required to adjust its timing to within ±T_e, as long as, for the UE configured with a pTAG and an sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment. If the transmission timing difference is bigger than the maximum transmission timing difference (i.e., 32.47us) UE may stop adjustment. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.7.3-2.

Table 7.1.7.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_q
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.7.

7.1.7.4 Test description

7.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. Propagation conditions are set according to Annex B clause B.0.
3. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

7.1.7.4.2 Test procedure

The test consists of two cells, PCell and SCell. PCell and SCell are in the Primary Timing Advance Group (pTAG) and the secondary Timing Advance Group (sTAG) respectively. The transmit timing accuracy is verified related to the downlink frame timing of SCell (Cell 2) in sTAG. The downlink timing of Cell 2 is changed and the change in UE transmit timing of SCell is observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Test 1 and Test 2 in Tables 7.1.7.5-1, 7.1.7.5-2 and 7.1.7.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The SS shall check that the UE transmit timing offsets of SCell in sTAG are $624 \times T_S$ to within the T_e limit specified in Table 7.1.7.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

9. The SS adjusts the downlink transmit timing for the activated SCell (Cell 2) to a delay of $+64 \times T_S$ (approximately +2 μs) compared to that in step 8. For Test 2, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

10. Step 10 applies for Test 1, but is omitted for Test 2. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 10 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+10) is within Rule 1 as specified in clause 7.1.7.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.7.5, the SS shall measure the change in SRS transmission timing over a 1.01s sliding window, with step size 10ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.7.5, the SS shall measure the change in SRS transmission timing over a 190ms sliding window, with step size 10ms. The three rules apply until the UE transmit timing offsets of SCell are ($624 \times T_S$) to within the limit specified in Table 7.1.7.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2).

11. In case for Test 1, the SS shall check that the UE transmit timing offsets of the SCell in sTAG stay at ($624 \times T_S$) to within the T_e limit specified in Table 7.1.7.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of the activated SCell (Cell 2). In case for Test 2, the SS shall check that the UE transmit timing offsets of the activated SCell (Cell 2) stay within the limit specified in Table 7.1.7.5-4 with respect to the first timing adjustment after downlink frame of the activated SCell (Cell 2) is changed. For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of the activated SCell (Cell 2) is changed is used.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 1-13 for each sub-test in Tables 7.1.7.5-1, 7.1.7.5-2 and 7.1.7.5-3 as appropriate.

7.1.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.7.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD UE transmit timing accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table 7.1.7.4.3-2: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test for SCell in sTAG requirement for Test 1

Derivation Path: 36.508, Table 4.8.2.1.5-1, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.1.7.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test for SCell in sTAG requirement for Test 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.1.7.4.3-4: *SCellToAddMod-r10:* Additional UE transmit timing accuracy for E-UTRAN TDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.1.7.4.3-5: *RadioResourceConfigCommonSCell-r10:* Additional UE transmit timing accuracy for E-UTRAN TDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.1.7.4.3-6: *RadioResourceConfigDedicatedSCell-r10:* Additional UE transmit timing accuracy for E-UTRAN TDD test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.1.7.4.3-7: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and 85 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.1.7.5 Test requirement

Tables 7.1.7.5-1, 7.1.7.5-2 and 7.1.7.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test.

Tables 7.1.7.5-4, 7.1.7.5-5 and 7.1.7.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.7.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test case

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10	10
E-UTRA RF Channel Number		1	1	2	2
Active PCell		Cell 1	Cell 1		
Active SCell				Cell 2	Cell 2
TAG configuration		pTAG	pTAG	sTAG	sTAG
Special subframe configuration[Note1]		6	6	6	6
Uplink-downlink configuration[Note2]		1	1	1	1
DRX cycle	ms	OFF	80[Note7]	OFF	80[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	R.6 TDD	R.6 TDD	R.6 TDD
OCNG Pattern[Note4]		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0	0
PBCH_RB		0	0		0
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
OCNG_RA[Note5]					
OCNG_RB[Note5]					
N_{oc}	dBm/15 kHz	-98	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	--65.25	--65.25	--65.25	--65.25
Propagation condition	-	AWGN	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211 [9].
Note 3: For the reference measurement channels, see clause A.2.2.
Note 4: For the OCNG pattern, see clause D.2.2.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.7.5-3.

Table 7.1.7.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test case

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.7.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for E-UTRAN TDD

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.7.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.7.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	15*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1) For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.7.5-5

2) For test 1, the minimum aggregate adjustment rate shall be 3.4 × T_S per 1.01 s.

3) For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.7.5-6.

Table 7.1.7.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.7.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth

7.1.7A.1 Test purpose

Same test purpose as defined in clause 7.1.7.1.

7.1.7A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances. Applicability requires support for FGI bit 5.

7.1.7A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.7.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.7A.

7.1.7A.4 Test description

7.1.7A.4.1 Initial conditions

Same initial conditions as in clause 7.1.7.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell

7.1.7A.4.2 Test procedure

Same test procedure as in clause 7.1.7.4.2

7.1.7A.4.3 Message contents

Same message contents as in clause 7.1.7.4.3

7.1.7A.5 Test requirement

Table 7.1.7A.5-1, 7.1.7A.5-2 and 7.1.7A.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test. The listed parameter values in Tables 7.1.7A.5-1 will replace the values of corresponding parameters in Table 7.1.7.5-1 other parameters keep the same.

Table 7.1.7A.5-4, 7.1.7A.5-5 and 7.1.7A.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.7A.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for 20MHz +20MHz

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	20	20
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		R.10 TDD	R.10 TDD	R.10 TDD	R.10 TDD
OCNG Pattern defined in D.2.8 (OP.8 TDD)		OP.8 TDD	OP.8 TDD	OP.8 TDD	OP.8 TDD
Io^{Note1}	dBm/18 MHz	-62.24	-62.24	-62.24	-62.24
Note 1: Io level has been derived from other parameters for information purpose. It is not a settable parameter.					

Table 7.1.7A.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for 20MHz +20MHz

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneous Transmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.7A.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for 20MHz +20MHz

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.7A.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$.

Table 7.1.7A.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	15*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.7A.5-5.
2. For test 1, the minimum aggregate adjustment rate shall be 3.4 × T_S per 1.01 s.
3. For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.7A.5-6.

Table 7.1.7A.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.7A.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth

7.1.7B.1 Test purpose

Same test purpose as defined in clause 7.1.7.1.

7.1.7B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances. Applicability requires support for FGI bit 5.

7.1.7B.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.1.7.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.1.2 and A.7.1.7B.

7.1.7B.4 Test description

7.1.7B.4.1 Initial conditions

Same initial conditions as in clause 7.1.7.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for PCell and 10 MHz for SCell

7.1.7B.4.2 Test procedure

Same test procedure as in clause 7.1.7.4.2.

7.1.7B.4.3 Message contents

Same message contents as in clause 7.1.7.4.3.

7.1.7B.5 Test requirement

Table 7.1.7B.5-1, 7.1.7B.5-2 and 7.1.7B.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for SCell in sTAG for E-UTRAN TDD test. The listed parameter values in Tables 7.1.7B.5-1 will replace the values of corresponding parameters in Table 7.1.7.5-1 other parameters keep the same.

Table 7.1.7B.5-4, 7.1.7B.5-5 and 7.1.7B.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.7B.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for SCell in sTAG for 20MHz +10MHz

Parameter	Unit	Cell 1		Cell 2	
		Test 1	Test 2	Test 1	Test 2
E-UTRA RF Channel Number		1	1	2	2
Channel Bandwidth ($BW_{channel}$)	MHz	20	20	10	10
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2		R.10 TDD	R.10 TDD	R.6 TDD	R.6 TDD
OCNG Pattern defined in D.2.2 (OP.2 TDD) and in D.2.8 (OP.8 TDD)		OP.8 TDD	OP.8 TDD	OP.2 TDD	OP.2 TDD
Io^{Note1}	dBm/18 MHz	-62.24	-62.24	-	-
	dBm/9 MHz	-	-	-65.25	-65.25
Note 1: Io level has been derived from other parameters for information purpose. It is not a settable parameter.					

Table 7.1.7B.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for SCell in sTAG for 20MHz +10MHz

Field	Cell 1		Cell 2		Comment
	Test 1	Test 2	Test 1	Test 2	
srsBandwidthConfiguration	bw5	bw5	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	0	
duration	TRUE	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	85	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	0	
cyclicShift	cs0	cs0	cs0	cs0	No cyclic shift
srsAntennaPort	an1	an1	an1	an1	Number of SRS antenna ports
Note: For further information see clause 6.3.2 in TS 36.331 [5].					

Table 7.1.7B.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for SCell in sTAG for 20MHz +10MHz

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf80	
shortDRX	disable	disable	
Note: For further information see clause 6.3.2 in TS 36.331 [5].			

After the SCell (Cell 2) is activated, the UE transmit timing offsets for SCell in sTAG shall be within the requirements in Table 7.1.7B.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing of the activated SCell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.7B.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 TS 36.133 [4] is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing shall follow these rules:

1. For test 1, the maximum adjustment step size T_q shall be within the requirements in Table 7.1.7B.5-5
2. For test 1, the minimum aggregate adjustment rate shall be $3.4 \times T_S$ per 1.01 s.

3. For test 1, the maximum aggregate adjustment rate shall be within the requirements in Table 7.1.7B.5-6.

Table 7.1.7B.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	4.0*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.7B.5-6: Test requirement for maximum aggregate adjustment rate per 190 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 190 ms
≥10	4.6*T_S
NOTE: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.8 Void

7.1.9 Void

7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA

7.1.10.1 Test purpose

To verify that the Cat-M1 UE in CEModeA have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.1.10.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.10.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.10.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Cat-M1 UEs configured with CEModeA shall follow the requirement T_e defined for 1.4MHz in Table 7.1.10.3-1 regardless the downlink carrier bandwidth *(Editor's note: It is FFS for the Cat-M1 UEs configured with CEModeB).*

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied.

When in a TAG the transmission timing error between the UE and the reference timing exceeds $\pm T_e$, or in a sTAG the UE changes the downlink SCell for deriving the UE transmit timing for cells in the sTAG configured with one or two uplinks, the UE is required to adjust its timing to within $\pm T_e$ in that TAG, as long as,

- the UE is configured with a pTAG and one or two sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment, or

- the UE is configured with synchronous dual connectivity, the transmission timing difference between pTAG and psTAG does not exceed the maximum transmission timing difference (i.e., 35.21us) after such adjustment.

If the transmission timing difference after such adjustment is bigger than the maximum transmission timing difference UE may stop adjustment in this TAG. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing under the above mentioned scenarios shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.10.3-2.

Table 7.1.10.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Cat-M1 UEs configured with CEModeA shall follow the requirement T_q defined for 1.4MHz in Table 7.1.2-2 regardless the downlink carrier bandwidth *(Editor's note: It is FFS for the Cat-M1 UEs configured with CEModeB).*

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.10.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.10.4 Test description

7.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18(using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.10.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.10.5-1, 7.1.10.5-2 and 7.1.10.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.10.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.10.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.10.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The 0three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.10.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.10.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.10.5-4 For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF –CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.10.5-1, 7.1.10.5-2 and 7.1.10.5-3 as appropriate.

7.1.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 7.1.10.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.10.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.10.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.10.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw1	bw1 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 317 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.10.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.10.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeA configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.10.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.10.5 Test requirement

Tables 7.1.10.5-1, 7.1.10.5-2 and 7.1.10.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.10.5-4, 7.1.10.5-5 and 7.1.10.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.10.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
DRX cycle	ms	N/A	80[Note5]	640[Note5]
PRACH Configuration		PRACH_2CE As specified in A.9		
MPCCH Reference measurement channel[Note1]		R.16 FDD	R.16 FDD	R.16 FDD
OCNG Pattern[Note2]		OP.21 FDD	OP.21 FDD	OP.21 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PHICH_RA PHICH_RB MPDCCH_RA MPDCCH_RB OCNG_RA[Note3] OCNG_RB[Note3]	dB	0	0	0
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3+.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.7.1.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.10.5-3.

Table 7.1.10.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 4, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

Table 7.1.10.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA}\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $N_{TA}\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA}\times T_S \pm 15\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.10.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}})\times T_s$.

Table 7.1.10.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.10.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.10.5-6.

Table 7.1.10.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

Table 7.1.10.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA

7.1.11.1 Test purpose

To verify that the Cat-M1 UE in CEModeA have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.11.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.1.11.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.11.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.11.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Cat-M1 UEs configured with CEModeA shall follow the requirement T_e defined for 1.4MHz in Table 7.1.11.3-1 regardless the downlink carrier bandwidth *(Editor's note: It is FFS for the Cat-M1 UEs configured with CEModeB).*

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied.

When in a TAG the transmission timing error between the UE and the reference timing exceeds ±T_e, or in a sTAG the UE changes the downlink SCell for deriving the UE transmit timing for cells in the sTAG configured with one or two uplinks, the UE is required to adjust its timing to within ±T_e in that TAG, as long as,

- the UE is configured with a pTAG and one or two sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment, or
- the UE is configured with synchronous dual connectivity, the transmission timing difference between pTAG and psTAG does not exceed the maximum transmission timing difference (i.e., 35.21us) after such adjustment.

If the transmission timing difference after such adjustment is bigger than the maximum transmission timing difference UE may stop adjustment in this TAG. The reference timing shall be $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing under the above mentioned scenarios shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.11.3-2.

Table 7.1.11.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_q
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Cat-M1 UEs configured with CEModeA shall follow the requirement T_q defined for 1.4MHz in Table 7.1.2-2 regardless the downlink carrier bandwidth *(Editor's note: It is FFS for the Cat-M1 UEs configured with CEModeB).*

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.11.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.11.4 Test description

7.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18(using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA HD-FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.11.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.11.5-1, 7.1.11.5-2 and 7.1.11.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.11.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.11.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.11.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.11.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.11.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.11.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.11.5-4 For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF –CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.11.5-1, 7.1.11.5-2 and 7.1.11.5-3 as appropriate.

7.1.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 7.1.11.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.11.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.11.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and sc3 for Test 2 and Test 3	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.11.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 317 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.11.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.11.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeA configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.11.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.11.5 Test requirement

Tables 7.1.11.5-1, 7.1.11.5-2 and 7.1.11.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN HD-FDD test.

Tables 7.1.11.5-4, 7.1.11.5-5 and 7.1.11.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.11.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeA test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
DRX cycle	ms	N/A	80[Note5]	640[Note5]
PRACH Configuration		PRACH_2CE As specified in A.9		
MPCCH Reference measurement channel[Note1]		R.16 HD-FDD	R.16 HD-FDD	R.16 HD-FDD
OCNG Pattern[Note2]		OP.21 FDD	OP.21 FDD	OP.21 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.7.2.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.11.5-3.

Table 7.1.11.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeA test case

Field	Value			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	317	SRS periodicity of 2ms, 80 ms and 320ms for Test 1, 2 and 4, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

Table 7.1.11.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA}×T_S$ ± $15×T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64×T_S$ (for Test 1 and Test 2) or $+32×T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $N_{TA}×T_S$ ± $15×T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $N_{TA}×T_S$ ± $15×T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.11.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}})\times T_s$.

Table 7.1.11.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $±T_e$ the UE is required to adjust its timing to within $±T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.11.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.11.5-6.

Table 7.1.11.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
≥10	$4*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

Table 7.1.11.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
≥10	4.6*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA

Editor's note: This Test case is incomplete

- Minimum requirements might need an update.

7.1.12.1 Test purpose

To verify that the Cat-M1 UE in CEModeA have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.1.12.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.12.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.12.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_e
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Cat-M1 UEs configured with CEModeA shall follow the requirement T_e defined for 1.4MHz in Table 7.1.12.3-1 regardless the downlink carrier bandwidth *(Editor's note: It is FFS for the Cat-M1 UEs configured with CEModeB).*

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the reference cell except when the timing advance in clause 7.3 is applied.

When in a TAG the transmission timing error between the UE and the reference timing exceeds ±T_e, or in a sTAG the UE changes the downlink SCell for deriving the UE transmit timing for cells in the sTAG configured with one or two uplinks, the UE is required to adjust its timing to within ±T_e in that TAG, as long as,

- the UE is configured with a pTAG and one or two sTAG, the transmission timing difference between TAGs does not exceed the maximum transmission timing difference (i.e., 32.47us) after such adjustment, or

- the UE is configured with synchronous dual connectivity, the transmission timing difference between pTAG and psTAG does not exceed the maximum transmission timing difference (i.e., 35.21us) after such adjustment.

If the transmission timing difference after such adjustment is bigger than the maximum transmission timing difference UE may stop adjustment in this TAG. The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$ before the downlink timing of the reference cell. All adjustments made to the UE uplink timing under the above mentioned scenarios shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.12.3-2.

Table 7.1.12.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	17.5*T_S
3	9.5*T_S
5	5.5*T_S
≥10	3.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Cat-M1 UEs configured with CEModeA shall follow the requirement T_q defined for 1.4MHz in Table 7.1.2-2 regardless the downlink carrier bandwidth *(Editor's note: It is FFS for the Cat-M1 UEs configured with CEModeB).*

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.12.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements

7.1.12.4 Test description

7.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18(using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.12.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.12.5-1, 7.1.12.5-2 and 7.1.12.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is $624\times T_S$ to within the limits specified in Table 7.1.12.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 μs) for Test 1 and Test2 and to and a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15) ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one SRS transmission (subframe n) to next (subframe n+2) is within Rule 1 as specified in clause 7.1.12.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.12.5, the SS shall measure the change in SRS transmission timing over a 1.002s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.12.5, the SS shall measure the change in SRS transmission timing over a 198ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.12.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.12.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.12.5-4 For that purpose, the SRS transmission that takes place in the first DRX ON duration after downlink timing of Cell 1 is changed is used.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.12.5-1, 7.1.12.5-2 and 7.1.12.5-3 as appropriate.

7.1.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA with the following exceptions:

Table 7.1.12.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.12.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.12.4.3-3: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		TDD
}			

Table 7.1.12.4.3-4: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 15 for Test 1 and 85 for Test 2 and 325 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.12.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.12.4.3-6: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeA configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.12.4.3-7: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.12.5 Test requirement

Tables 7.1.12.5-1, 7.1.12.5-2 and 7.1.12.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.12.5-4, 7.1.12.5-5 and 7.1.12.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.12.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeA test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	10
Special subframe configuration[Note1]		6	6	6
Uplink-downlink configuration[Note2]		1	1	1
DRX cycle	Ms	N/A	80[Note7]	640[Note7]
PRACH configuration		PRACH_4CE As specified in A.9		
MPDCCH Reference measurement channel[Note3]		R.14 TDD	R.14 TDD	R.14 TDD
OCNG Pattern[Note4]		OP.11 TDD	OP.11 TDD	OP.11 TDD
PBCH_RA	dB	0	0	0
PBCH_RB		0	0	0
PSS_RA				
SSS_RA				
PHICH_RA				
PHICH_RB				
MPDCCH_RA				
MPDCCH_RB				
OCNG_RA[Note5]				
OCNG_RB[Note5]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	-65.25
	dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: For the reference measurement channels, see clause A.7.3.
Note 4: For the OCNG pattern, see clause D.2.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.12.5-3.

Table 7.1.12.5-2: Sounding Reference Signal Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeA test case

Field	Values			Comment
	Test 1	Test 2	Test 3	
srsBandwidthConfiguration	bw5	bw5	Bw5	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
Duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	325	SRS periodicity of 10, 80, 10 and 320 ms for Test 1, 2, 3 and 4 respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
SRS-AntennaPort	an1			Number of antenna ports used for SRS transmission

Table 7.1.12.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeA test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $(N_{TA} + 624)\times T_S \pm 12\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by $+64\times T_S$ (for Test 1 and Test 2) or $+32\times T_S$ (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within $(N_{TA} + 624)\times T_S \pm 12\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within $(N_{TA} + 624)\times T_S \pm 12\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.12.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}})\times T_s$.

Table 7.1.12.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	$(27)*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.12.5-5

2) The minimum aggregate adjustment rate shall be $3.4*T_S$ per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.12.5-6.

Table 7.1.12.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	$(18)*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

Table 7.1.12.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

Downlink Bandwidth (MHz)	Maximum adjustment per 198 ms
1.4	(16.8)*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7.1.13

7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB

Editor's note: This Test case is incomplete

- The number of repetitions for MPDCCH and MPUSCH are within brackets
- Some brackets remains in the Test requirement section
- Test Tolerances and test system uncertainties remains

7.1.14.1 Test purpose

To verify that the Cat-M1 UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.14.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1 that supports CEModeB. Applicability requires support for FGI bit 5.

7.1.14.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.14.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.14.3-1: T_e Timing Error Limit

CE Mode	T_e
A	24*T_S
B	48*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is specified in Table 7.1.14.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.14.3-2.

Table 7.1.14.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	T_q
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.14.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.14.4 Test description

7.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.14.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.14.5-1, 7.1.14.5-2 and 7.1.14.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.14.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of + 64 × T_S (approximately +2 μs) for Test 1 and Test2 and to and a delay of +32× T_S for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.

7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.14.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in MPUSCH repetition timing over a 1 s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.14.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.14.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.14.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.14.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.14.5-1, 7.1.14.5-2 and 7.1.14.5-3 as appropriate.

7.1.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 7.1.14.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.14.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.14.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.14.4.3-4: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeB configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
Release	NULL		
}			

Table 7.1.14.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.14.5 Test requirement

Tables 7.1.14.5-1, 7.1.14.5-2 and 7.1.14.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.14.5-4, 7.1.14.5-5 and 7.1.14.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.14.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
DRX cycle		ms	N/A	80[Note5]	640[Note5]
MPCCH Reference measurement channel[Note1]			R.18 FDD	R.18 FDD	R.18 FDD
OCNG Pattern[Note2]			OP.21 FDD	OP.21 FDD	OP.21 FDD
Number of repetitions	MPDCCH		[128]		
	MPUSCH		[32]		
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$		dB	-12+TT	-12+TT	-12+TT
$\hat{E}_s/N_{oc}$		dB	-12+TT	-12+TT	-12+TT
Io[Note4]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see clause A.4.7.
Note 2: For the OCNG pattern, see clause D.1.21.
Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 5: DRX related parameters are defined in Table 7.1.14.5-2.

Table 7.1.14.5-2: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD for Cat-M1 UE in CEModeB test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

For parameters specified in Tables 7.1.14.5-1 and 7.1.14.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and , respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S$ ± [$24 \times T_S$] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by +[64×T_S] (for Test 1 and Test 2) or +[32×T_S] (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within N_{TA}×T_S ± [24×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within N_{TA}×T_S ± [12×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.14.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.14.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
B	(48+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.14.5-5

2) The minimum aggregate adjustment rate shall be 7*T_S per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.14.5-6.

Table 7.1.14.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	(17.5+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.14.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	Maximum adjustment per 198 ms
B	(17.5+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB

Editor's note: This Test case is incomplete

- The number of repetitions for MPDCCH and MPUSCH are within brackets

- Some brackets remains in the Test requirement section
- Test Tolerances and test system uncertainties remains

7.1.15.1 Test purpose

To verify that the Cat-M1 UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.15.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that supports CEModeB. Applicability requires support for FGI bit 5.

7.1.15.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.15.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.15.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*Ts
B	48*Ts
NOTE 1: Ts is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.14.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.15.3-2.

Table 7.1.15.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.15.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.15.4 Test description

7.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.15.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.15.5-1, 7.1.15.5-2 and 7.1.15.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.15.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 μs) for Test 1 and Test2 and to and a delay of +32× T_S for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.
7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.15.5. To check that the minimum adjustment rate is

within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in MPUSCH repetition timing over a 1 s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.15.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.15.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.15.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.15.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.15.5-1, 7.1.15.5-2 and 7.1.15.5-3 as appropriate.

7.1.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 7.1.15.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.15.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.15.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.15.4.3-4: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeB configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
Release	NULL		
}			

Table 7.1.15.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN HD-FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.15.5 Test requirement

Tables 7.1.15.5-1, 7.1.15.5-2 and 7.1.15.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN HD-FDD test.

Tables 7.1.15.5-4, 7.1.15.5-5 and 7.1.15.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.15.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
DRX cycle		ms	N/A	80[Note5]	640[Note5]
MPCCH Reference measurement channel[Note1]			R.6 HD-FDD	R.6 HD-FDD	R. 6 HD-FDD
OCNG Pattern[Note2]			OP.21 FDD	OP.21 FDD	OP.21 FDD
Number of repetitions	MPDDCH		[128]		
	MPUSCH		[32]		
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note3]					
OCNG_RB[Note3]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$		dB	-12+TT	-12+TT	-12+TT
$\hat{E}_s/N_{oc}$		dB	-12+TT	-12+TT	-12+TT
Io[Note4]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN
Note 1: For the reference measurement channels, see clause A.7.5. Note 2: For the OCNG pattern, see clause D.1.21. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 5: DRX related parameters are defined in Table 7.1.15.5-2.					

Table 7.1.15.5-2: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN HD-FDD for Cat-M1 UE in CEModeB test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	
Note 1: For further information see clause 6.3.2 in TS 36.331[5].			

For parameters specified in Tables 7.1.15.5-1 and 7.1.15.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm [24 \times T_S]$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by +[64×T_S] (for Test 1 and Test 2) or +[32×T_S] (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within N_{TA}×T_S ± [24×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within N_{TA}×T_S ± [12×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.15.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.15.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
B	(48+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.15.5-5

2) The minimum aggregate adjustment rate shall be 7*T_S per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.15.5-6.

Table 7.1.15.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	(17.5+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.15.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	$T_{q\_}$
B	(17.5+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.16 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB

Editor's note: This Test case is incomplete

- The number of repetitions for MPDCCH and MPUSCH are within brackets

- Some brackets remains in the Test requirement section
- Test Tolerances and test system uncertainties remains

7.1.16.1 Test purpose

To verify that the Cat-M1 UE in CEModeB have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.16.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 that supports CEModeB. Applicability requires support for FGI bit 5.

7.1.16.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.16.3-1. This requirement applies when it is the first transmission in a DRX, eDRX_CONN cycle, or the first transmission in a repetition period (R>1) for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the reference cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the reference cell. $N_{\text{TA\_Ref}}$ for PRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in clause 7.3 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.16.3-1: T_e Timing Error Limit

CE Mode	$T_{e\_}$
A	24*Ts
B	48*Ts
NOTE 1: Ts is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When it is not the first transmission in a DRX or eDRX_CONN cycle or there is no DRX or no eDRX_CONN cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving cell except when the timing advance in clause 7.3 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.14.3-1.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q seconds.

2) The minimum aggregate adjustment rate shall be 7 * T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.24.2 and shown in table 7.1.16.3-2.

Table 7.1.16.3-2: T_q Maximum Autonomous Time Adjustment Step

CE Mode	T_q
A	17.5*T_S
B	17.5*Ts
NOTE 1: T_S is the basic timing unit defined in TS 36.211. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

When a repetition period is configured on the uplink, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period for which R>1.

The normative reference for this requirement is TS 36.133 [4] clause 7.24 and A.7.1.16.

NOTE 1: Both the allowed UE frequency error and the UE time adjustment quantisation can affect the result of the test, and it is not possible to test the UE Transmit Timing Accuracy in isolation from these core requirements. They are therefore taken into account when setting the Test Tolerances and the Test Requirements.

7.1.16.4 Test description

7.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 (using only main UE Tx/Rx antenna).
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.16.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. By measuring the reception of the MPUSCH, the transmit timing accuracy can be measured and the requirements can be verified by the SS.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.16.5-1, 7.1.16.5-2 and 7.1.16.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.16.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of $+64 \times T_S$ (approximately +2 µs) for Test 1 and Test2 and to and a delay of $+32\times T_S$ for Test 3 compared to that in step 5. For Test 2 and Test 3, the downlink timing adjustment shall be done at (40 ± 15)ms before the next DRX On duration period.
7. Step 7 applies for Test 1, but is omitted for Test 2 and Test 3. The test system samples the UE Transmit Timing once per SRS transmission (periodicity 2 subframes). To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one MPUSCH repetition (in subframe n) to next MPUSCH repetition (in subframe n+2) is within Rule 1 as specified in clause 7.1.16.5. To check that the minimum adjustment rate is

within Rule 2 as specified in clause 7.1.1.5, the SS shall measure the change in MPUSCH repetition timing over a 1 s sliding window, with step size 2ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.16.5, the SS shall measure the change in MPUSCH repetition timing over a 198 ms sliding window, with step size 2ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.16.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. In case for Test 1 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.16.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1. In case for Test 2 and Test 3, the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.16.5-4. By measuring the reception of the MPUSCH repetitions, the transmit timing accuracy can be measured and the requirements can be verified.

9. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.

11. Repeat step 1-10 for each sub-test in Tables 7.1.16.5-1, 7.1.16.5-2 and 7.1.16.5-3 as appropriate.

7.1.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB with the following exceptions:

Table 7.1.16.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.16.4.3-2: *RRCConnectionReconfiguration*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated SEQUENCE {			
mac-MainConfig CHOICE {			
explicitValue	MAC-MainConfig-RBC		
}			
physicalConfigDedicated	PhysicalConfigDedicated - DEFAULT		RBC
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.1.16.4.3-3: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement for Test 2 and Test 3

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Set according to specific test; sf80 for Test 2 and sf640 for Test 3	
sf80	0		
}			
shortDRX	Not present		
}			
}			
}			

Table 7.1.16.4.3-4: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm20	Allowed value for CEModeB configured UE	
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
Release	NULL		
}			

Table 7.1.16.4.3-5: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		
}			

7.1.16.5 Test requirement

Tables 7.1.16.5-1, 7.1.16.5-2 and 7.1.16.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN TDD test.

Tables 7.1.16.5-4, 7.1.16.5-5 and 7.1.16.5-6 define the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.16.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeB test case

Parameter		Unit	Value		
			Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	1	1
Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10
Special subframe configuration[Note1]			6	6	6
Uplink-downlink configuration[Note2]			1	1	1
DRX cycle		ms	N/A	80[Note7]	640[Note7]
MPDCCH Reference measurement channel[Note3]			[R.16 TDD]	[R.16 TDD]	[R.16 TDD]
OCNG Pattern[Note4]			OP.11 TDD	OP.11 TDD	OP.11 TDD
PBCH_RA		dB	0	0	0
Number of repetitions	MPDCCH		[128]		
	MPUSCH		[32]		
PBCH_RB			0	0	0
PSS_RA					
SSS_RA					
PHICH_RA					
PHICH_RB					
MPDCCH_RA					
MPDCCH_RB					
OCNG_RA[Note5]					
OCNG_RB[Note5]					
N_{oc}		dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$		dB	-12+TT	-12+TT	-12+TT
$\hat{E}_s/N_{oc}$		dB	-12+TT	-12+TT	-12+TT
Io[Note6]		dBm/9 MHz	-86.4	-86.4	-86.4
		dBm/1.08 MHz	N/A	N/A	N/A
Propagation condition		-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: For the reference measurement channels, see clause A.7.6.
Note 4: For the OCNG pattern, see clause D.2.11.
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.16.5-2.

Table 7.1.16.5-2: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN TDD for Cat-M1 UE in CEModeB test case

Field	Value		Comment
	Test 2	Test 3	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf640	
shortDRX	disable	disable	

Note 1: For further information see clause 6.3.2 in TS 36.331[5].

For parameters specified in Tables 7.1.16.5-1 and 7.1.16.5-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in clause 7.1.2. The UE shall not adjust the transmission timing autonomously during an ongoing repetition period. Adjustments can only be done at the end of a last subframe in a repetition period.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwidth, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX (for Test1) and DRX with a cycle length of 80 ms or a cycle length of 640 ms (Tests 2 and 3, respectively):

a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within N_{TA}×T_S ± [24×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

b) The test system adjusts the downlink transmit timing for the cell by +[64×T_S] (for Test 1 and Test 2) or +[32×T_S] (for Test 3) compared to that in (a).

c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in clause 7.1.2 until the UE transmit timing offset is within N_{TA}×T_S ± [24×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2 and Test 3.

d) The test system shall verify that the UE transmit timing offset stays within N_{TA}×T_S ± [12×T_S] with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. For test 2 and test 3 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

The UE transmit timing offset shall be within the requirements in Table 7.1.16.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.1.16.5-4: Test requirement for T_e Timing Error Limit

CE Mode	$T_{e\_}$
B	(48+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds ±T_e the UE is required to adjust its timing to within ±T_e.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.16.5-5

2) The minimum aggregate adjustment rate shall be 7*T_S per second (To be adjusted after TT analysis).

3) The maximum aggregate adjustment rate shall be within the requirements in Table 7.1.16.5-6.

Table 7.1.16.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

CE Mode	$T_{q\_}$
B	(17.5+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

Table 7.1.16.5-6: Test requirement for maximum aggregate adjustment rate per 198 ms

CE Mode	$T_{q\_}$
B	(17.5+TT)*T_S
NOTE 1: T_S is the basic timing unit defined in TS 36.211 [9]. NOTE 2: This requirement applies regardless of the downlink carrier bandwidth.	

7.1.17 HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE in In-Band Mode under Normal Coverage

Editor's notes: This clause is incomplete, the following items are TBD

- *Test system uncertainty and tolerance is undefined.*
- *Connection diagram is TBD.*
- *Test requirement of TS 36.133 include bracket.*
- *Message content for SIB1 In-Band Mode is FFS.*
- *The NB-IoT PRB location in LTE cell need to be defined in TS36.508.*

7.1.17.1 Test purpose

To verify that the Category NB1 UE under normal coverage is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits.

7.1.17.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE Category NB1.

7.1.17.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to ±T_e where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.20 and shown in table in Table 7.1.17.3-1. This requirement applies when it is the first transmission in a DRX cycle or the first transmission in a repetition period (R>1) for NPUSCH and NPRACH, the first transmission after an uplink transmission gap in a repetition period (R>1) for NPUSCH and NPRACH. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the serving NB-IoT cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the serving NB-IoT cell. $N_{\text{TA\_Ref}}$ for NPRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in TS 36.133 clause 7.22 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.17.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	[80*T_S]
Note 1: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for NPUSCH the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving NB-IoT cell except when the timing advance in TS 36.133 clause 7.22 is applied such that the UE transmission timing error shall be less than or equal to ±T_e, where the timing error limit value T_e is specified in Table 7.1.17.3-1.

The UE is required to adjust its timing to within ±T_e when the transmission timing error between the UE and the reference timing exceeds ±Te.

When no repetition period is configured, or the configured repetition period is R=1, all adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be 58.33*T_S seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be 58.33*T_S per 200ms.

When a repetition period is configured on the uplink for which R>1, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period other than at initial transmission as defined above.

The normative reference for this requirement is TS 36.133 [4] clause 7.20 and A.7.1.17.

7.1.17.4 Test description

7.1.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: As specified in Table 7.1.17.5-1 and 7.1.17.5-2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure [TBD].

2. The general test parameter settings are set according to Table 7.1.17.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA FDD carrier and one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.1.17.4.1-1: General Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
NB-IoT Operation mode		In-band
DRX		OFF
NPRACH configuration		As specified in A.10.3
NPDCCH repetition level		1
NPUSCH repetition level		1

7.1.17.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Ncell 1. The downlink timing of Ncell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting NPUSCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in idle State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

2. Set the parameters according to Tables 7.1.17.5-1 and 7.1.17.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. SS sends uplink scheduling information via NPDCCH DCI format N0 for C_RNTI to schedule uplink subframes.

4. The UE shall transmit NPUSCH and the SS shall verify that the UE transmit timing offset is within the limits specified in Table 7.1.17.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

5. The SS adjusts the downlink transmit timing for the Ncell 1 to a delay of $+64\times T_S$ compared to that in step 4.

6. Immediately after Step 5, the SS sends NPDCCH including uplink grant for NPUSCH transmission and immediately after receiving NPUSCH the test system repeatedly sends NPDCCH including uplink grant for NPUSCH transmission. The SS samples the UE Transmit Timing once per NPUSCH transmission. To check Rule 1, the SS shall check that the maximum time adjustment step size T_q between one NPUSCH transmission to next is within Rule 1 as specified in clause 7.1.17.5. To check that the minimum adjustment rate is within Rule 2 as specified in clause 7.1.17.5, the SS shall measure the change in NPUSCH transmission timing over a 1.008s sliding window, with step size 8ms. To check that the maximum adjustment rate is within Rule 3 as specified in clause 7.1.17.5, the SS shall measure the change in NPUSCH transmission timing over a 192ms sliding window,

with step size 8ms. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.17.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

7. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.17.5-3 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

7.1.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 7.1.17.4.3-1: NPDCCH-ConfigDedicated-NB: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Normal Coverage

Derivation Path: 36.331 clause 6.7.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDCCH-ConfigDedicated-NB-DEFAULT ::= SEQUENCE {			
npdcch-NumRepetitions-r13	r1	Set NPDCCH repetition to 1	
npdcch-StartSF-USS-r13	v8		
npdcch-Offset-USS-r13	zero		
}			

7.1.17.5 Test requirement

Tables 7.1.17.5-1, 7.1.17.5-2 define the primary settings of Ncell and Cell for UE transmit timing accuracy for HD-FDD Category NB1 UE transmit timing accuracy test.

Table 7.1.17.5-3 define the timing error limit with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1 include Test Tolerances.

Table 7.1.17.5-1: Ncell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
RF Channel Number		1
$BW_{channel}$	kHz	200
PRB location within Cell		30
NPDSCH parameter defined in clause A.10.2		R.15 HD-FDD
NPDCCH parameter defined in clause A.10.1		R.27 HD-FDD
NOCNG Pattern defined in clause D.3		NOP.1 FDD
NPBCH_RA	dB	0
NPBCH_RB		
NPSS_RA		
NSSS_RA		
NPDCCH_RA		
NPDCCH_RB		
NPDSCH_RA		
NPDSCH_RB		
NOCNG_RA Note1		
NOCNG_RB Note1		
N_{oc}	dBm/15 kHz	Specified in Table 7.1.17.5-2
$\hat{E}_s/I_{ot}$	dB	4+TT
$\hat{E}_s/N_{oc}$	dB	4+TT
Antenna Configuration		2x1
Propagation condition	-	AWGN
Note 1 NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

Table 7.1.17.5-2: Cell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under normal coverage

Parameter	Unit	Value
		Test 1
E-UTRA RF Channel Number		1
$BW_{channel}$	MHz	10
PBCH_RA	dB	0
PBCH_RB		
PSS_RA		
SSS_RA		
PCFICH_RB		
PHICH_RA		
PHICH_RB		
PDCCH_RA		
PDCCH_RB		
OCNG_RA[Note1]		
OCNG_RB[Note1]		
N_{oc}	dBm/15 kHz	-98+TT
$\hat{E}_s/I_{ot}$	dB	4+TT
$\hat{E}_s/N_{oc}$	dB	4+TT
Antenna configuration		2x1
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.		

The UE transmit timing offset shall be within the requirements in Table 7.1.17.5-3.

Table 7.1.17.5-3: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	[80*T_S]
Note 1: T_S is the basic timing unit defined in TS 36.211	

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow three rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be 58.33*T_S seconds.

2) The minimum aggregate adjustment rate shall be 7*T_S per second.

3) The maximum aggregate adjustment rate shall be 58.33*T_S per 200ms.

7.1.18 HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE in In-Band Mode under Enhanced Coverage

Editor's notes: This clause is incomplete, the following items are TBD

- *Test system uncertainty and tolerance is undefined.*
- *Connection diagram is TBD.*

- *Test requirement of TS 36.133 include bracket.*
- *Message content for SIB1 In-Band Mode is FFS.*
- *The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508.*

7.1.18.1 Test purpose

To verify that the Category NB1 UE under enhanced coverage is capable of following the frame timing change of the connected eNode B, that the UE initial transmit timing accuracy is within the specified limits and that the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period other than at initial transmission.

7.1.18.2 Test applicability

This test applies to all types of E-UTRAN HD-FDD UE release 13 and forward of UE Category NB1.

7.1.18.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.20 and shown in table in Table 7.1.18.3-1. This requirement applies when it is the first transmission in a DRX cycle or the first transmission in a repetition period (R>1) for NPUSCH and NPRACH, the first transmission after an uplink transmission gap in a repetition period (R>1) for NPUSCH and NPRACH. The reference point for the UE initial transmit timing control requirement shall be the downlink timing of the serving NB-IoT cell minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$. The downlink timing is defined as the time when the first detected path (in time) of the corresponding downlink frame is received from the serving NB-IoT cell. $N_{\text{TA\_Ref}}$ for NPRACH is defined as 0. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in TS 36.133 clause 7.22 was applied. $N_{\text{TA\_Ref}}$ for other channels is not changed until next timing advance is received.

Table 7.1.18.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_{e}
0.18	[80*T_S]
Note 1: T_S is the basic timing unit defined in TS 36.211	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for NPUSCH the UE shall, when no repetitions are configured on the uplink or the repetition period is R=1, be capable of changing the transmission timing according to the received downlink frame of the serving NB-IoT cell except when the timing advance in TS 36.133 clause 7.22 is applied such that the UE transmission timing error shall be less than or equal to $\pm T_e$, where the timing error limit value T_e is specified in Table 7.1.18.3-1.

The UE is required to adjust its timing to within $\pm T_e$ when the transmission timing error between the UE and the reference timing exceeds ±Te.

When a repetition period is configured on the uplink for which R>1, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period other than at initial transmission as defined above.

The normative reference for this requirement is TS 36.133 [4] clause 7.20 and A.7.1.18.

7.1.18.4 Test description

7.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: As specified in Table 7.1.18.5-1 and 7.1.18.5-2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure [TBD].

2. The general test parameter settings are set according to Table 7.1.18.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA FDD carrier and one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.1.18.4.1-1: General Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
NB-IoT Operation mode		In-band	In-band
DRX		OFF	ON
NPRACH configuration		As specified in A.10.3	
NPDCCH repetition level		128	128
NPUSCH repetition level		32	32
Note 1: DRX related parameters are defined in Table 7.1.18.5-3.			

7.1.18.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Ncell 1. The downlink timing of Ncell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting NPUSCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in idle State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

2. Set the parameters according to Tables 7.1.18.5-1 and 7.1.18.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. SS sends uplink scheduling information via NPDCCH DCI format N0 for C_RNTI to schedule uplink subframes.

4. The UE shall transmit NPUSCH and the SS shall verify that the UE transmit timing offset is within the limits specified in Table 7.1.18.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1.

5. After 16ms from the initial transmission in Step 4, the test system adjusts the downlink transmit timing for the Ncell by $+200\times T_S$ compared to that in Step 4.

6. Step 6 applies for Test 1, but is omitted for Test 2. The SS shall verify that for Test 1 the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period.

7. The SS sends NPDCCH including uplink grant for NPUSCH transmission and shall verify that the UE transmit timing offset stays within $N_{TA}\times T_S \pm [80]\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of NB-IoT Ncell 1. For test 2 the UE transmit timing offset shall be verified for the first transmission in the DRX cycle immediately after DL timing adjustment.

7.1.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 7.1.18.4.3-1: *MAC-MainConfig-NB*: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Enhanced Coverage

Derivation Path: TS 36.508 clause 8.1.8, Table 8.1.8.2.1.5-1: MAC-MainConfig-NB-SRB			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-NB-SRB ::= SEQUENCE {			
drx-Config-r13 CHOICE {			
setup SEQUENCE {			
onDurationTimer-r13	pp1		
drx-InactivityTimer-r13	pp0		
drx-RetransmissionTimer-r13	pp0		
drx-Cycle-r13	sf2048		
drx-StartOffset-r13	0		
drx-ULRetransmissionTimer-r13	pp0		
}			
}			
}			

Table 7.1.18.4.3-2: NPDCCH-ConfigDedicated-NB: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Enhanced Coverage

Derivation Path: TS 36.508 clause 8.1.6, Table 8.1.6.3-3: NPDCCH-ConfigDedicated-NB-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
NPDCCH-ConfigDedicated-NB-DEFAULT ::= SEQUENCE {			
npdcch-NumRepetitions-r13	r1024	Set NPDCCH repetition to 128	
}			

Table 7.1.18.4.3-3:NB-IoT Physical layer parameters for DCI format N0: Additional HD-FDD Category NB1 UE Transmit Timing Accuracy test requirement under Enhanced Coverage

Derivation Path: TS 36.508 clause 8.1.3, Table 8.1.3.6.1.1-1: NB-IoT Physical layer parameters for DCI format N0				
Parameter	**Value**	**Value in binary**	**Comment**	**Condition**
Repetition number	*5*	“101”	Set NPUSCH repetition to 32	

7.1.18.5 Test requirement

Tables 7.1.18.5-1, 7.1.18.5-2 and 7.1.18.5-3 define the primary settings of Ncell and Cell for UE transmit timing accuracy for HD-FDD Category NB1 UE transmit timing accuracy test.

Table 7.1.18.5-4 define the timing error limit with respect to the first detected path (in time) of the corresponding downlink frame of Ncell 1 include Test Tolerances.

Table 7.1.18.5-1: Ncell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
RF Channel Number		1	1
$BW_{channel}$	kHz	200	200
PRB location within Cell		30	30
NPDSCH parameter defined in clause A.10.2		R.15 HD-FDD	R.15 HD-FDD
NPDCCH parameter defined in clause A.10.1		R.27 HD-FDD	R.27 HD-FDD
NOCNG Pattern defined in clause D.3		NOP.1 FDD	NOP.1 FDD
NPBCH_RA	dB	0	0
NPBCH_RB			
NPSS_RA			
NSSS_RA			
NPDCCH_RA			
NPDCCH_RB			
NPDSCH_RA			
NPDSCH_RB			
NOCNG_RA [Note1]			
NOCNG_RB [Note1]			
N_{oc}	dBm/15 kHz	Specified in Table 7.1.18.5-2	Specified in Table 7.1.18.5-2
$\hat{E}_s/I_{ot}$	dB	-12+TT	-12+TT
$\hat{E}_s/N_{oc}$	dB	-12+TT	-12+TT
Antenna Configuration		2x1	2x1
Propagation condition	-	AWGN	AWGN
Note 1 NOCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 7.1.18.5-2: Cell specific Test Parameters for UE Transmit Timing Accuracy Tests for HD-FDD Category NB1 UE in In-Band mode under enhanced coverage

Parameter	Unit	Value	
		Test 1	Test 2
E-UTRA RF Channel Number		1	1
$BW_{channel}$	MHz	10	10
PRB location within Cell		30	30
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA[Note1]			
OCNG_RB[Note1]			
N_{oc}	dBm/15 kHz	-98+TT	-98+TT
$\hat{E}_s/I_{ot}$	dB	-12+TT	-12+TT
$\hat{E}_s/N_{oc}$	dB	-12+TT	-12+TT
Antenna Configuration		2x1	2x1
Propagation condition	-	AWGN	AWGN
Note 1 OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 7.1.18.5-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN HD-FDD Category NB1 UE In-band mode under enhanced coverage

Field	Value	Comment
	Test 2	
onDurationTimer	pp1	
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
longDRX-CycleStartOffset	sf2048	
shortDRX	disable	
Note 1: For further information see clause 6.7.3 in TS 36.331.		

The UE transmit timing offset shall be within the requirements in Table 7.1.18.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_s$.

Table 7.1.18.5-4: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
0.18	[80*T_S]
Note 1: T_S is the basic timing unit defined in TS 36.211	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

When a repetition period is configured on the uplink for which R>1, the UE shall not adjust the uplink transmission timing autonomously during an ongoing repetition period other than at initial transmission as defined above.

7.2 UE Timing Advance

7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy

7.2.1.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment requirements in an AWGN model.

7.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.2.1.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.1.

7.2.1.4 Test description

7.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

2. The general test parameter settings are set according to Table 7.2.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.1.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.1.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Tables 7.2.1.5-1 and 7.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be N_{TA} = 0.
6. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.1.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be N_{TA} = 128.
9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.1.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			
}			

Table 7.2.1.4.3-3: *SoundingRSUL-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		

7.2.1.5 Test requirement

Tables 7.2.1.4.1-1, 7.2.1.5-1 and 7.2.1.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test.

Table 7.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.1.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN FDD - UE timing advance adjustment accuracy test case

Field	Value	Comment
srs-BandwidthConfig	bw5	
srs-SubframeConfig	sc3	Once every 5 subframes
ackNackSRS-SimultaneousTransmission	FALSE	
srsMaxUpPts	N/A	Not applicable for E-UTRAN FDD
srs-Bandwidth	0	No hopping
srs-HoppingBandwidth	hbw0	
freqDomainPosition	0	
duration	TRUE	Indefinite duration
srs-ConfigIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [15].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy

7.2.2.1 Test purpose

The purpose of the test is to verify E-UTRAN TDD Timing Advance adjustment accuracy requirements, in an AWGN model.

7.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.2.2.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.2.

7.2.2.4 Test description

7.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. The general test parameter settings are set according to Table 7.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.2.4-1 General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.2.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and Sounding Reference Signals (SRS), are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Tables 7.2.2.5-1, 7.2.2.5-2 and 7.2.2.5-3. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be N_{TA} = 0.
6. The UE shall transmit SRS and adjust its uplink timing from the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE receive the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.1.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be N_{TA} = 128.
9. The UE shall transmit SRS and adjust its uplink timing from the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE receive the time advance command.
10. The timing of the first SRS transmission after sub-frame n+6 and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
12. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.2.4.3-1: Common Exception messages for E-UTRAN TDD - UE timing advance adjustment accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.2.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		
}			

Table 7.2.2.4.3-3: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	15	SRS periodicity of 10	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test requirement

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	infinity		

7.2.2.5 Test requirement

Tables 7.2.2.4.1-1, 7.2.2.5-1 and 7.2.2.5-2 define the primary level settings for E-UTRAN TDD - UE timing advance adjustment accuracy test.

Table 7.2.2.5-1 Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration[Note1]		6	
Uplink-downlink configuration[Note2]		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note3]	dB		
OCNG_RB[Note3]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io[Note4]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211. Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.2.5-2: Sounding Reference Signal Configuration for E-UTRAN TDD Transmit Timing Accuracy Test

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmissions with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth

7.2.3.1 Test purpose

Same test purpose as defined in clause 7.2.1.1.

7.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31.

7.2.3.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.1.3 with the following exceptions:

- Instead of A.7.2.1 → use A.7.2.3.

7.2.3.4 Test description

7.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. The general test parameter settings are set according to Table 7.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.3.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Note 1: For the reference measurement channels, see clause A.1.1 and A.2.1. Note 2: See Table 7.2.1.4.1-1 for the ther parameters. Note 3: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2			

7.2.3.4.2 Test procedure

Same test procedure as defined in clause 7.2.1.4.2 with the following exceptions:

- Instead of Table 7.2.1.5-1 → use Table 7.2.3.5-1.

7.2.3.4.3 Message contents

Same message contents as defined in clause 7.2.1.4.3.

7.2.3.5 Test requirement

Same test requirement as defined in clause 7.2.1.5 with the following exceptions:

Tables 7.2.3.4.1-1, 7.2.3.5-1 and 7.2.1.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test for 5MHz bandwidth.

Table 7.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy for 5MHz bandwidth test case

Parameter	Unit	Value	
		T1	T2
$BW_{channel}$	MHz	5	
OCNG Patterns defined in D.1.15 (OP.15 FDD)		OP.15 FDD	
Io^{Note2}	dBm/4.5 MHz	-68.5	
Note 1: For the reference measurement channels, see clause A.2.1. Note 2: See Table 7.2.1.5-1 for the other parameters.			

7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG

7.2.4.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment accuracy requirements in an AWGN model.

7.2.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.4.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a TAG indicates N_{TA} values by index values of $T_A = 0, 1, 2, ..., 1282$, where an amount of the time alignment for the TAG is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, for a TAG indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of $T_A = 0, 1, 2,..., 63$, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing for the TAG by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.4.

7.2.4.4 Test description

7.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. The general test parameter settings are set according to Table 7.2.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Two Cells are used. Cell 1 is PCell on the primary component carrier; Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

Table 7.2.4.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.4.4.2 Test procedure

The test consists of two cells. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands for sTAG are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured for SCell in sTAG. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Tables 7.2.4.5-1 and 7.2.4.5-2. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. SS shall transmit one message with a Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 31 which indicate zero adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T1 shall be $N_{TA} = 0$.

9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

10. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.4.5-1.

11. SS shall transmit a sequence of messages with Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T2 shall be $N_{TA} = 128$.

12. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

13. The result from the SRS and adjustment of the timing advance in step 12) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.0 \times T_S$ +TT to the signalled timing advance value compared to the timing of preceding uplink transmission.

14. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

15. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

16. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

17. Repeat step 2-16 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.4.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table7.2.4.4.3-2: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.2.4.4.3-3: *SCellToAddMod-r10:* Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.2.4.4.3-4: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.2.4.4.3-5: *RadioResourceConfigDedicatedSCell-r10:* Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.2.4.4.3-6: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7		
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.2.4.5 Test requirement

Tables 7.2.4.4.1-1, 7.2.4.5-1 and 7.2.4.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG.

Table 7.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value			
		Cell1		Cell2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Active PCell		Cell1	Cell1		
Active SCell				Cell2	Cell2
TAG configuration		pTAG	pTAG	sTAG	sTAG
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note1]	dB				
OCNG_RB[Note1]	dB				
Timing Advance Command (T_A)		/	/	31	39
$\hat{E}_s/I_{ot}$	dB	3		3	
N_{oc}	dBm/15 KHz	-98		-98	
$\hat{E}_s/N_{oc}$	dB	3		3	
Io[Note2]	dBm/9 MHz	-65.5		-65.5	
Propagation Condition		AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.					

Table 7.2.4.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN FDD - UE timing advance adjustment accuracy test for SCell in sTAG

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG

7.2.5.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN TDD timing advance adjustment accuracy requirements in an AWGN model.

7.2.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.5.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a TAG indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment for the TAG is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, for a TAG indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing for the TAG by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.5.

7.2.5.4 Test description

7.2.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for both PCell and SCell as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.45.
2. The general test parameter settings are set according to Table 7.2.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.

4. Two Cells are used. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier. PCell is in the Primary Timing Advance Group (pTAG) and SCell is in the secondary Timing Advance Group (sTAG). Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

Table 7.2.5.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.5.4.2 Test procedure

The test consists of two cells. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands for sTAG are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured for SCell in sTAG. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with UL CA.
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to T1 in Tables 7.2.5.5-1 and 7.2.5.5-2. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. SS shall transmit one message with a Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 31 which indicate zero adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T1 shall be $N_{TA} = 0$.
9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
10. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.5.5-1.
11. SS shall transmit a sequence of messages with Timing Advance Command MAC Control Element for sTAG, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value for sTAG. The timing advance adjustment during T2 shall be N_{TA} = 128.

12. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

13. The result from the SRS and adjustment of the timing advance in step 12) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

14. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

15. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

16. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

17. Repeat step 2-16 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.5.4.3-1: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: Clause 4.6.1 Table 4.6.1-8, condition SCell_AddMod

Table7.2.5.4.3-2: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC, condition SCell_AddMod			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		
stag-ToAddModList-r11 SEQUENCE (SIZE (1..maxSTAG-r11)) OF SEQUENCE {	Not present		
stag-Id-r11	1		
timeAlignmentTimerSTAG-r11	infinity		
}			
}			

Table 7.2.5.4.3-3: *SCellToAddMod-r10:* Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 7.2.5.4.3-4: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-13A, condition UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigCommon-r10 CHOICE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5		
srs-SubframeConfig	sc3		
ackNackSRS-SimultaneousTransmission	FALSE		
srs-MaxUpPts	Not Present		
}			
}			
uplinkPowerControlCommonSCell-v1130 SEQUENCE	Not present		
}			

Table 7.2.5.4.3-5: *RadioResourceConfigDedicatedSCell-r10:* Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: 36.508, Table 4.6.3-19AA			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {			
physicalConfigDedicatedSCell-r10	PhysicalConfigDedicated SCell-r10-DEFAULT		
mac-MainConfigSCell-r11 SEQUENCE {			
stag-Id-r11	1		
}			
}			

Table 7.2.5.4.3-6: *PhysicalConfigDedicatedSCell-r10-DEFAULT*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-6A PhysicalConfigDedicatedSCell-r10-DEFAULT with UL_CA			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
soundingRS-UL-ConfigDedicated-r10 CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping.	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	15		
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			
soundingRS-UL-ConfigDedicated-v1020 SEQUENCE {			
srs-AntennaPort-r10	an1		
}			
}			
}			

7.2.5.5 Test requirement

Tables 7.2.5.4.1-1, 7.2.5.5-1 and 7.2.5.5-2 define the primary level settings for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG.

Table 7.2.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG

Parameter	Unit	Value			
		Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Active PCell		Cell1			
Active SCell				Cell2	
TAG configuration		pTAG		sTAG	
Special subframe configuration[Note1]		6		6	
Uplink-downlink configuration[Note2]		1		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD		OP.1 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note3]	dB				
OCNG_RB[Note3]	dB				
Timing Advance Command (T_A)				31	39
$\hat{E}_s/I_{ot}$	dB	3		3	
N_{oc}	dBm/15 KHz	-98		-98	
$\hat{E}_s/N_{oc}$	dB	3		3	
Io[Note4]	dBm/9 MHz	-65.5		-65.5	
Propagation Condition		AWGN		AWGN	
Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211. Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.					

Table 7.2.5.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to ±4.5 × T_S seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth

7.2.5A.1 Test purpose

Same test purpose as defined in clause 7.2.5.1.

7.2.5A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.5A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.2.5.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.5A.

7.2.5A.4 Test description

7.2.5A.4.1 Initial conditions

Same initial conditions as in clause 7.2.5.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell
- Instead of table 7.2.5.4.1-1, use table 7.2.5A.4.1-1.

Table 7.2.5A.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.5A.4.2 Test procedure

Same test procedure as in clause 7.2.5.4.2

7.2.5A.4.3 Message contents

Same message contents as in clause 7.2.5.4.3

7.2.5A.5 Test requirement

Table 7.2.5A.4.1-1, 7.2.5A.5-1 and 7.2.5A.5-2 define the primary level settings. The listed parameter values in Table 7.2.5A.5-1 will replace the values of corresponding parameters in Table 7.2.5.5-1 other parameters keep the same.

Table 7.2.5A.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +20 MHz

Parameter	Unit	Value			
		Cell 1		Cell 2	
		T1	T2	T1	T2
$BW_{channel}$	MHz	20		20	
OCNG Patterns defined in D.2.7		OP.7 TDD		OP.7 TDD	
Io^{Note4}	dBm/18 MHz	-62.5		-62.5	

Table 7.2.5A.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +20 MHz

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth

7.2.5B.1 Test purpose

Same test purpose as defined in clause 7.2.5.1.

7.2.5B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that supports Uplink Carrier Aggregation and multiple timing advances.

7.2.5B.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 7.2.5.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.5B.

7.2.5B.4 Test description

7.2.5B.4.1 Initial conditions

Same initial conditions as in clause 7.2.5.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for PCell and 10 MHz for SCell
- Instead of table 7.2.5.4.1-1, use table 7.2.5B.4.1-1.

Table 7.2.5B.4.1-1: General Test Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +10 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		For Cell 1: DL Reference Measurement Channel R.3 TDD For Cell 2: DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		For Cell 1: DL Reference Measurement Channel R.10 TDD For Cell 2: DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.5B.4.2 Test procedure

Same test procedure as in clause 7.2.5.4.2

7.2.5B.4.3 Message contents

Same message contents as in clause 7.2.5.4.3

7.2.5B.5 Test requirement

Table 7.2.5B.4.1-1, 7.2.5B.5-1 and 7.2.5B.5-2 define the primary level settings. The listed parameter values in Table 7.2.5B.5-1 will replace the values of corresponding parameters in Table 7.2.5.5-1 other parameters keep the same.

Table 7.2.5B.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +10 MHz

Parameter	Unit	Value			
		Cell 1		Cell 2	
		T1	T2	T1	T2

$BW_{channel}$	MHz	20	10
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.7 (OP.7 TDD)		OP.7 TDD	OP.1 TDD
Io[Note4]	dBm/18 MHz	-62.5	N/A
	dBm/9 MHz	N/A	-65.5

Table 7.2.5B.5-2: Sounding Reference Signal Configuration to be used in E-UTRAN TDD - UE timing advance adjustment accuracy test for SCell in sTAG for 20 MHz +10 MHz

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note: For further information see clause 6.3.2 in TS 36.331 [5].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

7.2.6.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment accuracy requirements for Cat-M1 UE in CEModeA in an AWGN model.

7.2.6.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE Release 13 and forward of UE category M1.

7.2.6.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame n+6 for a timing advancement command received in sub-frame n.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, for a cell indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment for the cell is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.6.

7.2.6.4 Test description

7.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set according to Table 7.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.6.4.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

PDSCH parameters: DL Reference Measurement Channel		R.20 FDD	As specified in clause A.8.1
MPDCCH parameters: DL Reference Measurement Channel		R.16 FDD	As specified in clause A.7.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.6.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (*timeAlignmentTimer* IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to T1 in Tables 7.2.6.5-1 and 7.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an *RRCConnectionReconfiguration* message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. SS shall transmit one message with a Timing Advance Command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.

6. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.6.5-1.

8. SS shall transmit a sequence of messages with Timing Advance Command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.

9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.

10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

12. The SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including *PagingRecord* with *ue-Identity*) for the UE and ensures the UE is in State 3A-CE according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.6.4.3-1: Common Exception messages for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.6.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			
}			

Table 7.2.6.4.3-3: *SoundingRSUL-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.6.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		

7.2.6.5 Test requirement

Tables 7.2.6.4.1-1, 7.2.6.5-1 and 7.2.6.5-2 define the primary level settings for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA.

Table 7.2.6.5-1: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.1		R.20 FDD	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.1		R.16 FDD	
OCNG Patterns defined in clause D.1.21		OP.21 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cells is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.6.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Field	Value	Comment
srsBandwidthConfiguration	Bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note 1: For further information see clause 6.3.2 in TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

7.2.7.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN HD-FDD UE timing advance adjustment accuracy requirements for Cat-M1 UE in CEModeA in an AWGN model.

7.2.7.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1.

7.2.7.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.6.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.7.

7.2.7.4 Test description

7.2.7.4.1 Initial conditions

Same initial conditions as in clause 7.2.6.4.1 with following exceptions:

- Instead of Table 7.2.6.4.1-1 → use Table 7.2.7.4.1-1.

Table 7.2.7.4.1-1: General Test Parameters for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Parameter	Unit	Value	Comment
PDSCH parameters: DL Reference Measurement Channel		R.10 HD-FDD	As specified in clause A.8.2
MPDCCH parameters: DL Reference Measurement Channel		R.6 HD-FDD	As specified in clause A.7.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.7.4.2 Test procedure

Same test procedure as in clause 7.2.6.4.2 with following exceptions:

- Instead of Tables 7.2.6.5-1 → use Table 7.2.7.5-1.
- Instead of Table 7.2.6.5-2 → use Table 7.2.7.5-1.

7.2.7.4.3 Message contents

Same message contents as in clause 7.2.6.4.3.

7.2.7.5 Test requirement

Tables 7.2.7.4.1-1, 7.2.7.5-1 and 7.2.7.5-2 define the primary level settings for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA.

Table 7.2.7.5-1: Cell specific Test Parameters for E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.2		R.10 HD-FDD	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.2		R.6 HD-FDD	
OCNG Patterns defined in clause D.1.21		OP.21 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA^Note1	dB		
OCNG_RB^Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io^Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.7.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Field	Value	Comment
srsBandwidthConfiguration	Bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note 1: For further information see clause 6.3.2 in TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

7.2.8.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN TDD timing advance adjustment accuracy requirements for Cat-M1 UE in CEModeA in an AWGN model.

7.2.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE Release 13 and forward of UE category M1.

7.2.8.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.2.6.

The normative reference for this requirement is TS 36.133 [4] clause 7.3.2.2 and A.7.2.8.

7.2.8.4 Test description

7.2.8.4.1 Initial conditions

Same initial conditions as in clause 7.2.6.4.1 with following exceptions:

- Instead of Table 7.2.6.4.1-1 → use Table 7.2.8.4.1-1.

Table 7.2.8.4.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

PDSCH parameters: DL Reference Measurement Channel		R.16 TDD	As specified in clause A.8.3
MPDCCH parameters: DL Reference Measurement Channel		R.14 TDD	As specified in clause A.7.3
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.8.4.2 Test procedure

Same test procedure as in clause 7.2.6.4.2 with following exceptions:

- Instead of Tables 7.2.6.5-1 → use Table 7.2.8.5-1.
- Instead of Table 7.2.6.5-2 → use Table 7.2.8.5-1.

7.2.8.4.3 Message contents

Same message contents as in clause 7.2.6.4.3 with condition TDD.

7.2.8.5 Test requirement

Tables 7.2.8.4.1-1, 7.2.8.5-1 and 7.2.8.5-2 define the primary level settings for E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA.

Table 7.2.8.5-1: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.3		R.16 TDD	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.3		R.14 TDD	
OCNG Patterns defined in clause D.2.11		OP.11 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
MPDCCH_RA	dB		
MPDCCH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io[Note2]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cells is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.8.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA

Field	Value	Comment
srsBandwidthConfiguration	Bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN TDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
SRS-AntennaPort	an1	Number of antenna ports used for SRS transmission
Note 1: For further information see clause 6.3.2 in TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.9 HD-FDD UE Timing Advance Adjustment Accuracy Test for Category NB1 UE in Standalone Mode under Enhance Coverage

Editor's notes: This clause is incomplete, the following items are TBD

- Test system uncertainty and tolerance is undefined.
- Connection diagram is TBD.

7.2.9.1 Test Purpose

The purpose of the test is to verify E-UTRAN Timing Advance adjustment accuracy requirements for category NB1 UE in enhanced coverage in an AWGN model.

7.2.9.2 Test applicability

This test applies to all types of HD-FDD UE release 13 and forward of UE Category NB1.

7.2.9.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance, see TS 36.321 [17] clause 5.2.

UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+12 for a timing advance command received in sub-frame *n*. In case repetitions are used on the downlink, sub-frame *n* refers to the last subframe in the repetition period in which the message containing the MAC control information was received. The UE shall not apply a TA command during an uplink repetition period.

The UE shall adjust the timing of its transmissions with a relative accuracy better than or equal to $\pm 13.33^* T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiples of $16^* T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 16.1.2. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 16.1.2. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.21.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.22 and A.7.2.9.

7.2.9.4 Test description

7.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table Annex E-4 and TS 36.508 [7] clauses 8.1.3 and 8.1.4.2.

Channel Bandwidth to be tested: 200 KHz.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure [TBD].

2. The general test parameter settings are set according to Table 7.2.9.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one cell specified in the test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.9.4.1-1: General Test Parameters for E-UTRAN Timing Advance Accuracy Test for Category NB1 UE in Standalone Mode under Enhanced Coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			Standalone	
CP Length			Normal	
Timing Advance Command (T_A) value during T1			31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2			39	N_{TA} = 128
Number of repetitions	NPDCCH		128	
	NPUSCH		32	
DRX			OFF	
T1		s	5	
T2		s	5	

7.2.9.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and the UE is scheduled in uplink subframes to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in idle State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

2. Set the parameters according to T1 in Tables 7.2.9.5-1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS sends uplink scheduling information via NPDCCH DCI format N0 for C_RNTI to schedule uplink subframes according to TS 36.508 [7] clause 8.1.3.6, Table 8.1.3.6.1.1-1.

4. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be N_{TA} = 0.

5. The UE shall transmit NPUSCH and adjust its uplink timing at the beginning of sub-frame n+40 for a timing advance command T_A received in sub-frame n. Sub-frame n is the last subframe in the repetition period of NPDCCH in which the timing advance command is received by the UE.

6. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.9.5-1.

7. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be N_{TA} = 128.

8. The UE shall transmit NPUSCH and adjust its uplink timing at the beginning of sub-frame n+40 for a timing advance command T_A received in sub-frame n. Sub-frame n is the last subframe in the repetition period of NPDCCH in which the timing advance command is received by the UE.

9. The result from the NPUSCH and adjustment of the timing advance in step 8) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 13.33 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.

10. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm$ 13.33 $\times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

11. The SS shall transmit RRCConnectionRelease-NB message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5 (if the paging fails, switches off and on the UE and ensures the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5),

    or

    - switches off and on the UE and ensures the UE is in State 2A-NB with CP CIoT Optimisation according to TS 36.508 [7] clause 8.1.5.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6.

7.2.9.5 Test requirement

Tables 7.2.9.4.1-1, 7.2.9.5-1 and 7.2.9.5-2 define the primary level settings for HD-FDD UE timing advance adjustment accuracy test.

Table 7.2.9.5-1: Cell specific Test Parameters for E-UTRAN Timing Advance Accuracy Test for Category NB1 UE in Standalone Mode under Enhanced Coverage

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	kHz	200	
NPDSCH parameters: DL Reference Measurement Channel defined in A.10.2		R.20 HD-FDD	
NPDCCH parameters: DL Reference Measurement Channel defined in A.10.1		R.32 HD-FDD	
NOCNG Patterns defined in D.3		NOP.3 FDD	
NPBCH_RA	dB	0	
NPBCH_RB	dB		
NPSS_RA	dB		
NSSS_RA	dB		
NPDCCH_RA	dB		
NPDCCH_RB	dB		
NPDSCH_RA	dB		
NPDSCH_RB	dB		
NOCNG_RA Note1	dB		
NOCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	-12+TT	
N_{oc}	dBm/15 KHz	-88+TT	
$\hat{E}_s/N_{oc}$	dB	-12+TT	
Io Note2	dBm/ 180 KHz	-76.9+TT	
Antenna Configuration		1x1	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

The UE shall apply the signalled Timing Advance value to the transmission timing at subframe n+40, where subframe n is the last subframe in the repetition period of NPDCCH in which the timing advance command is received by the UE.

NOTE: In the test requirement the timing advance adjustment delay of 40 subframes include:

- NPUSCH repetition period equal to 32 subframes and
- Uplink delay of 8 subframes. This is the time between the last subframe in the repetition period of NPDCCH and the first subframe in the repetition period of the corresponding NPUSCH.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 13.33 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.3 Radio Link Monitoring

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

7.3.1.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.1.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send an out-of-sync indication to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.1.

7.3.1.4 Test description

The test consists of four subtests with one cell configured; the difference between the subtests is the number of transmitter antennas and the propagation channel. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.1.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

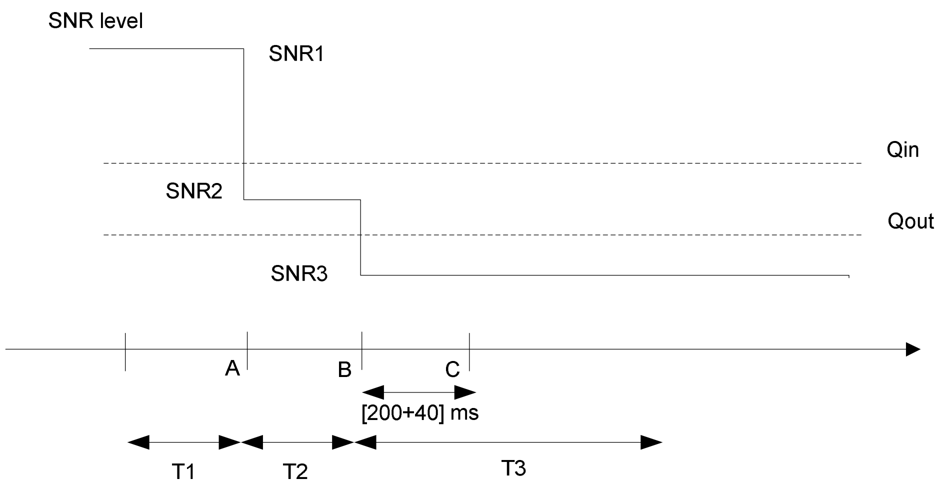

Figure 7.3.1.4-1: SNR variation for out-of-sync testing

7.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1:As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.10 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.9
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.10
2. The general test parameter settings for the different subtests are set up according to Table 7.3.1.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.1.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	R.6 FDD	R.7 FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	10	
Correlation Matrix and Antenna Configuration			1x2	2x2	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	8	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	2	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		s	1	1	1	1	
T2		s	0.4	0.4	0.4	0.4	
T3		s	0.5	0.5	0.5	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.							

7.3.1.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.1.5-1 for subtest 1 and 2 and according to T1 in Table and 7.3.1.5-2 for subtest 3 and 4. Propagation conditions are set according to Annex B clause B.1.1 for subtests 1 and 2 and according to B.2.2 for subtests 3 and 4. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and according to T2 in Table 7.3.1.5-2 for subtests 3 and 4. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and according to T3 in Table 7.3.1.5-2 for subtests 3 and 4. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and Table 7.3.1.5-2 for subtests 3 and 4.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.1.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.1.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.1.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync test 1 and 3 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.1.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync test 2 and 4 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.1.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.1.5 Test requirement

Table 7.3.1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x2			2x2		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6	dB	-4.1	-8.9	-14.1	-4.3	-8.9	-14.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.

Table 7.3.1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6	dB	-0.6	-4.7	-12.3	-1.4	-5.3	-13.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.							

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.1_1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports

Editor's note: This Test case is incomplete

- The Test Tolerances and Test Requirements applicable are undefined
- Test case are not present in TS36.521-2

7.3.1_1.1 Test purpose

Same as 7.3.1.1.

7.3.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands.

7.3.1_1.3 Minimum conformance requirements

Same as 7.3.1.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.1.

7.3.1_1.4 Test description

Same as 7.3.1.4.

7.3.1_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1:As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.76
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.76
2. The general test parameter settings for the different subtests are set up according to Table 7.3.1_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.1_1.4.3.1
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.1_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.1.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4, instead of 2x2 use 2x4
- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.1_1.4.2 Test procedure

Same Test Procedure as in 7.3.1.4.2 with the following changes:

- Instead of Table 7.3.1.5-1 use Table 7.3.1_1.5-1
- Instead of Table 7.3.1.5-2 use Table 7.3.1_1.5-2

7.3.1_1.4.3 Message contents

Same as 7.3.1.4.3.

7.3.1_1.5 Test requirement

Table 7.3.1_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x4			2x4		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-4.1	-8.9	-17+TT	-4.3	-8.9	-17+TT
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.1_1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x4 Low			2x4 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-0.6	-4.7	-15+TT	-1.4	-5.3	-15.7+TT
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.
Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync

7.3.2.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.2.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.2.

7.3.2.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the number of transmitter antennas. Each subtest consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.2.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

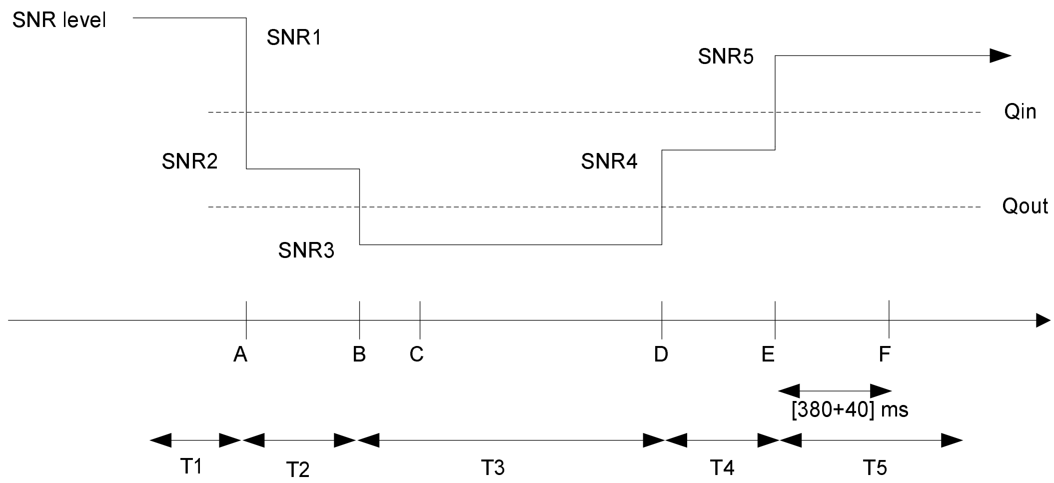

Figure 7.3.2.4-1: SNR variation for in-sync testing

7.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.9.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.2.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.2.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Value</th><th rowspan="2">Comment</th></tr>
<tr><th>Test 1</th><th>Test 2</th></tr>
<tr><td colspan="2">PCFICH/PDCCH/PHICH parameters</td><td></td><td>R.6 FDD</td><td>R.7 FDD</td><td>As specified in section A.2.1
None of the PDCCH are intended for the UE under test</td></tr>
<tr><td colspan="2">OCNG parameters</td><td></td><td>OP.2 FDD</td><td>OP.2 FDD</td><td>As specified in section D.1.2.</td></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1</td><td>Cell 1</td><td>Cell 1 is on E-UTRA RF channel number 1</td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td>Normal</td><td></td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>1</td><td>One E-UTRA FDD carrier frequency is used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth ($BW_{channel}$)</td><td>MHz</td><td>10</td><td>10</td><td></td></tr>
<tr><td colspan="2">Correlation Matrix and Antenna Configuration</td><td></td><td>1x2 Low</td><td>2x2 Low</td><td>Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2</td></tr>
<tr><td rowspan="6">In sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1C</td><td>1C</td><td>As defined in section 5.3.3.1.4 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td>2</td><td rowspan="5">In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section and Table 7.6.1-2 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>4</td><td>4</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>0</td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td></td><td>0</td><td>-3</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td></td><td>4</td><td>1</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>1A</td><td>As defined in section 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td>2</td><td rowspan="5">Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section 7.6.1 and Table 7.6.1-1 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td><td>8</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>0</td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>4</td><td>1</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>4</td><td>1</td></tr>
<tr><td colspan="2">DRX</td><td></td><td>OFF</td><td>OFF</td><td></td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>2000</td><td>2000</td><td>T310 is enabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213.</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>2</td><td>2</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">Propagation channel</td><td></td><td>ETU 70 Hz</td><td>ETU 70 Hz</td><td></td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>0.5</td><td>0.5</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>0.4</td><td>0.4</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>1.36</td><td>1.36</td><td></td></tr>
<tr><td colspan="2">T4</td><td>s</td><td>0.4</td><td>0.4</td><td></td></tr>
<tr><td colspan="2">T5</td><td>s</td><td>1</td><td>1</td><td></td></tr>
<tr><td colspan="6">Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.2.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.2.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.2.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.2.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.2.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.2.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.2.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.2.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync test 1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.2.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync test 2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.2.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.2.5 Test requirement

Table 7.3.2.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x2 Low					2x2 Low				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD					OP.2 FDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.6	-4.7	-12.3	-7.2	-0.6	-1.4	-5.3	-13.1	-8.2	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.2.4-1

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.2_1 E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports

Editor's note: This Test case is incomplete

- The Test Tolerances and Test Requirements applicable are undefined

- Test case are not present in TS36.521-2

7.3.2_1.1 Test purpose

Same as 7.3.2.1.

7.3.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that supports 4Rx on all its FDD operating bands.

7.3.2_1.3 Minimum conformance requirements

Same as 7.3.2.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.2.

7.3.2_1.4 Test description

Same as 7.3.2.4.

7.3.2_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.75.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.76.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.2_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.2_1.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.2_1.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

See Table 7.3.2.4.1 with the following changes:

- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.2_1.4.2 Test procedure

Same Test Procedure as in 7.3.2.4.2 with the following changes:

- Instead of Table 7.3.2.5-1 use Table 7.3.2_1.5-1

7.3.2_1.4.3 Message contents

Same as 7.3.2.4.3.

7.3.2_1.5 Test requirement

Table 7.3.2_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x4 Low					2x4 Low				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD					OP.2 FDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6 Note 7	dB	-0.6	-4.7	-14+TT	-9.9+TT	-0.6	-1.4	-5.3	-15.7+TT	-10.8+TT	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.2.4-1 Note 7: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1											

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

7.3.3.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.3.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send an out-of-sync indication to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.3.

7.3.3.4 Test description

The test consists of four subtests with one cell configured; the difference between the subtests is the number of transmitter antennas and the propagation channel. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.3.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

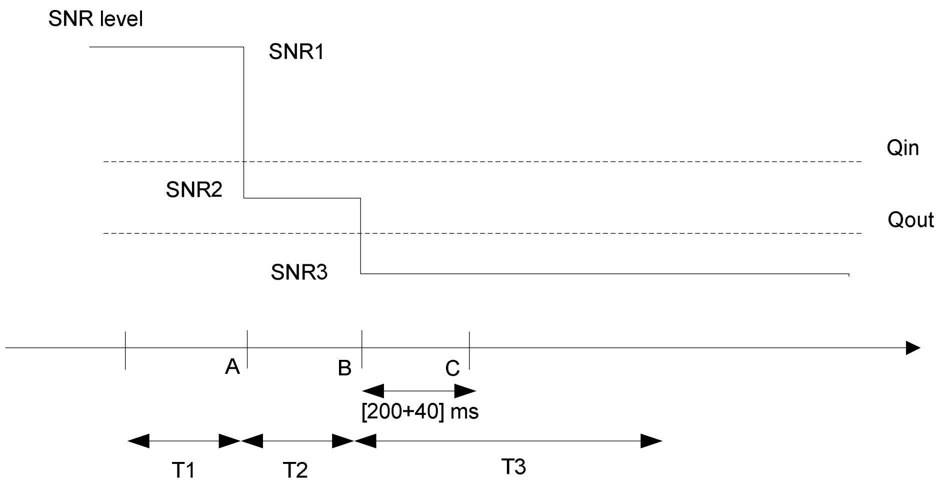

Figure 7.3.3.4-1: SNR variation for out-of-sync testing

7.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.10 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.9
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.10

2. The general test parameter settings for the different subtests are set up according to Table 7.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.3.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.3.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	10	
Correlation Matrix and Antenna Configuration			1x2	2x2	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	8	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	1	1	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		s	1	1	1	1	
T2		s	0.4	0.4	0.4	0.4	
T3		s	0.5	0.5	0.5	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel							

7.3.3.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.3.5-1 for subtests 1 and 2 and according to T1 in Table and 7.3.3.5-2 for subtest 3 and 4. Propagation conditions are set according to Annex B clause B.1.1 for subtests 1 and 2 and according to B.2.2 for subtests 3 and 4. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and according to T2 in Table 7.3.3.5-2 for subtests 3 and 4. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and according to T3 in Table 7.3.3.5-2 for subtests 3 and 4. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each uplink subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and Table 7.3.3.5-2 for subtests 3 and 4.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.3.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.3.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.3.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync test 1 and 3 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.3.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync test 2 and 4 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.3.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.3.5 Test requirement

Table 7.3.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x2			2x2		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 3]	dB						
OCNG_RB[Note 3]	dB						
SNR [Note 8]	dB	-4.5	-8.5	-13.7	-4.6	-8.6	-13.8
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.

Table 7.3.3.5-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 3	dB						
OCNG_RB Note 3	dB						
SNR Note 8	dB	-0.6	-4.5	-12.1	-1.4	-5.0	-12-8
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.3_1 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports

Editor's note: This Test case is incomplete.

- The Test Tolerances are undefined

7.3.3_1.1 Test purpose

Same as 7.3.3.1.

7.3.3_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that supports 4Rx on all its TDD operating bands.

7.3.3_1.3 Minimum conformance requirements

Same as 7.3.3.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.3.

7.3.3_1.4 Test description

Same as 7.3.3.4.

7.3.3_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.75 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.76
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.76

2. The general test parameter settings for the different subtests are set up according to Table 7.3.3_1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.3_1.4.3.1

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.3_1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

See Table 7.3.3.4.1-1 with the following changes:

- Instead of antenna configuration 1x2 use 1x4, instead of 2x2 use 2x4

- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.3_1.4.2 Test procedure

Same Test Procedure as in 7.3.3.4.2 with the following changes:

- Instead of Table 7.3.3.5-1 use Table 7.3.3_1.5-1
- Instead of Table 7.3.3.5-2 use Table 7.3.3_1.5-2

7.3.3_1.4.3 Message contents

Same as 7.3.3.4.3.

7.3.3_1.5 Test requirement

Table 7.3.3_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Antenna Configuration		1x4			2x4		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6, Note 7	dB	-4.5	-8.5	-16.6+TT	-4.6	-8.6	-16.7+TT
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

Table 7.3.3_1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x4 Low			2x4 Low		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.1 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 1]	dB						
OCNG_RB[Note 1]	dB						
SNR [Note 6, Note 7]	dB	-0.6	-4.5	-14.8+TT	-1.4	-5.0	-15.4+TT
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync

7.3.4.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.4.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.4.

7.3.4.4 Test description

The test consists of 2 subtests with one cell configured; the difference between the subtests is the number of transmitter antennas. Each subtest consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.4.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

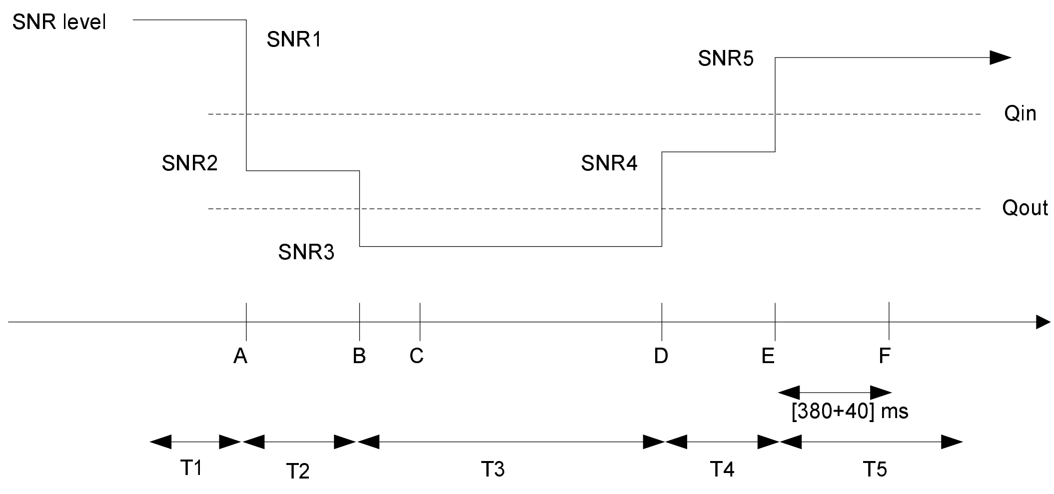

Figure 7.3.4.4-1: SNR variation for in-sync testing

7.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.9.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.4.4.3.
6. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.4.4.1-1: General test parameters for E-UTRAN TDD in-sync testing

Parameter		Unit	Value Test 1	Value Test 2	Comment
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	As specified in section A.2.2 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
n sync transmission parameters (Note 1)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	
DRX			OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	ETU 70 Hz	
T1		s	0.5	0.5	
T2		s	0.4	0.4	
T3		s	1.46	1.46	
T4		s	0.4	0.4	
T5		s	1	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.4.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.4.5-1 for subtest 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.4.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.4.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.4.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.4.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each uplink subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.4.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.4.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation

CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.4.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync test 1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.4.4.3-4: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync test 2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.4.4.3-5: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.4.5 Test requirement

Table 7.3.4.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x2 Low					2x2 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR [Note 8]	dB	-0.6	-4.5	-12.1	-7.2	-0.6	-1.4	-5.0	-12.8	-8.2	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.4.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.4_1 E-UTRAN TDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports

Editor's note: This Test case is incomplete

- The Test Tolerances are undefined

7.3.4_1.1 Test purpose

Same as 7.3.4.1.

7.3.4_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that supports 4Rx on all its TDD operating bands.

7.3.4_1.3 Minimum conformance requirements

Same as 7.3.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.4.

7.3.4_1.4 Test description

Same as 7.3.244.

7.3.4_1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.75.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.76.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.4_1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.4_1.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.4_1.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

See Table 7.3.4.4.1 with the following changes:

- Instead of antenna configuration 1x2 low use 1x4 low, instead of 2x2 low use 2x4 low

7.3.4_1.4.2 Test procedure

Same Test Procedure as in 7.3.4.4.2 with the following changes:

- Instead of Table 7.3.2.5-1 use Table 7.3.4_1.5-1

7.3.4_1.4.3 Message contents

Same as 7.3.4.4.3.

7.3.4_1.5 Test requirement

Table 7.3.4_1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x4 Low					2x4 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.1 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR [Note 8]	dB	-0.6	-4.5	-14.8 +TT	-9.9+ TT	-0.6	-1.4	-5.0	-15.4 +TT	-10.8 +TT	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.4.4-1.
Note 9: The SNR is adjusted for 4Rx as defined in 3A.4.1.2.1

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

7.3.5.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.5.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331, the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.5.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX}$ and $T_{Evaluate\_}Q_{in\_DRX}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.5.

7.3.5.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the DRX cycle length, number of transmit antennas and the propagation conditions. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.5.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

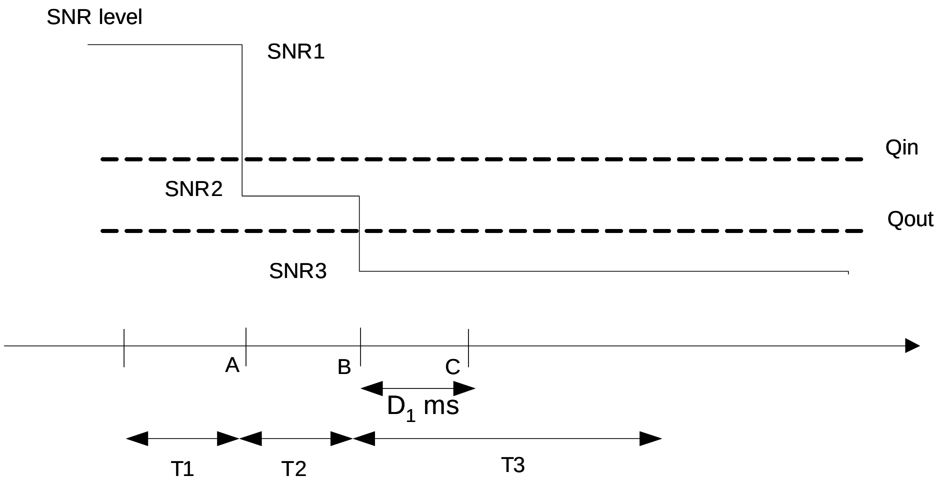

Figure 7.3.5.4-1: SNR variation for out-of-sync testing in DRX

7.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.10
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders)
2. The general test parameter settings for the different subtests are set up according to Table 7.3.5.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.5.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.5.4.1-1: General test parameters for E-UTRAN FDD out-of-sync in DRX testing

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Value</th><th rowspan="2">Comment</th></tr>
<tr><th>Test 1</th><th>Test 2</th></tr>
<tr><td colspan="2">PCFICH/PDCCH/PHICH parameters</td><td></td><td>R.7 FDD</td><td>R.6 FDD</td><td>As specified in section A.2.1.
None of the PDCCH are intended for the UE under test</td></tr>
<tr><td colspan="2">OCNG parameters</td><td></td><td>OP.2 FDD</td><td>OP.2 FDD</td><td>As specified in section D.1.2.</td></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1</td><td>Cell 1</td><td>Cell 1 is on E-UTRA RF channel number 1</td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td>Normal</td><td></td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>1</td><td>One E-UTRA FDD carrier frequency is used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth ($BW_{channel}$)</td><td>MHz</td><td>10</td><td>10</td><td></td></tr>
<tr><td colspan="2">Correlation Matrix and Antenna Configuration</td><td></td><td>2x2 Low</td><td>1x2</td><td>Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>1A</td><td>As defined in section 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td>2</td><td rowspan="5">Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td><td>8</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>-3</td><td>0</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>1</td><td>4</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>1</td><td>4</td></tr>
<tr><td colspan="2">DRX cycle</td><td>ms</td><td>40</td><td>1280</td><td>See Table 7.3.5.5-2</td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>0</td><td>0</td><td>T310 is disabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213 [8].</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>2</td><td>2</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">Propagation channel</td><td></td><td>ETU 70 Hz</td><td>AWGN</td><td>.</td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>4</td><td>32</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>1.6</td><td>12.8</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>1.8</td><td>13</td><td></td></tr>
<tr><td colspan="6">Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.5.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.5.5-1 for subtest 1 and 2. Propagation conditions are set according to Annex B clause B.2.2 for subtests 1 and according to B.1.1 for subtests 2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.5.5-1 for subtests 1 and 2. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.5.5-1 for subtests 1 and 2. T3 starts.

5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B

   and

   b) For subtest 1: does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   For subtest 2: does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.5.5-1 for subtests 1 and 2.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.5.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.5.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.5.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.5.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.5.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.5.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.5.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.5.5 Test requirement

Table 7.3.5.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			1x2		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6	dB	-1.4	-5.3	-13.1	-4.1	-8.9	-14.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.5.4-1.

Table 7.3.5.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 7.3.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0).

In subtest 1 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3).

In subtest 2 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 6500 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

7.3.6.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.6.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331, the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.6.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.6.

7.3.6.4 Test description

The test consists of one subtest with one cell configured. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.6.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

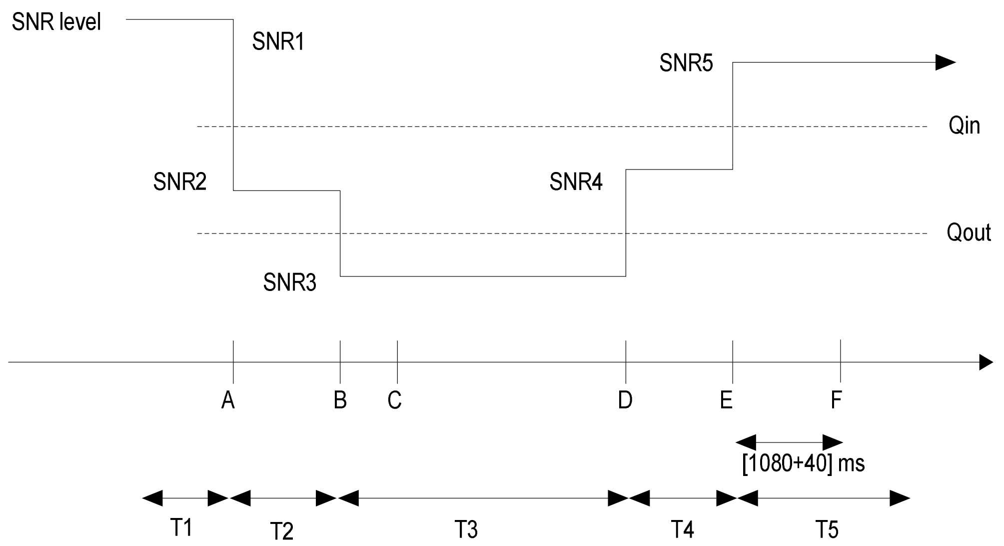

Figure 7.3.6.4-1: SNR variation for in-sync testing in DRX

7.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. The general test parameter settings for the test is set up according to Table 7.3.6.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.6.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.6.4.1-1: General test parameters for E-UTRAN FDD in-sync in DRX testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.6 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Configuration			1x2	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table 7.3.6.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.6.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.6.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.6.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.6.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.6.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.6.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.6.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.6.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.6.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.6.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.6.5 Test requirement

Table 7.3.6.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Antenna Configuration		1x2				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_R B Note1	dB					
SNR Note 6	dB	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.6.4-1.

Table 7.3.6.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [8] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

7.3.7.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.7.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.7.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX}$ and $T_{Evaluate\_}Q_{in\_DRX}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.7.

7.3.7.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the DRX cycle length, number of transmit antennas and the propagation conditions. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.7.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

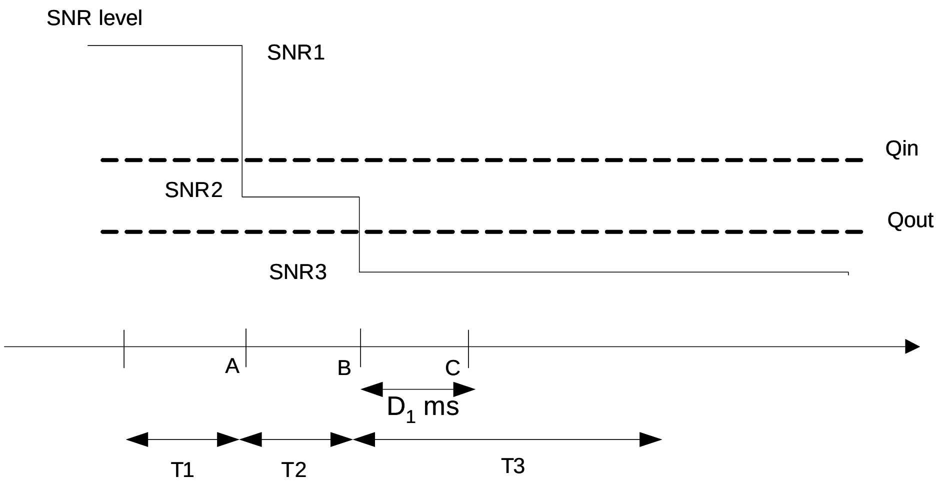

Figure 7.3.7.4-1: SNR variation for out-of-sync testing in DRX

7.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.10
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders)

2. The general test parameter settings for the different subtests are set up according to Table 7.3.7.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.7.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.7.4.1-1: General test parameters for E-UTRAN TDD out-of-sync in DRX testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.7 TDD	R.6 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	1x2	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		-3	0	
	Ratio of PDCCH to RS EPRE	dB	1	4	
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table 7.3.7.5-2
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	AWGN	.
T1		s	4	32	
T2		s	1.6	12.8	
T3		s	1.8	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.7.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.7.5-1 for subtest 1 and 2. Propagation conditions are set according to Annex B clause B.2.2 for subtests 1 and according to B.1.1 for subtests 2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.7.5-1 for subtests 1 and 2. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.7.5-1 for subtests 1 and 2. T3 starts.

5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B

   and

   b) For subtest 1: does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   For subtest 2: does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.7.5-1 for subtests 1 and 2.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.7.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.7.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.7.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.7.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_DRX_L
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.7.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.7.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.7.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.7.5 Test requirement

Table 7.3.7.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			1x2		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR [Note 8]	dB	-1.4	-5.0	-12.8	-4.5	-8.5	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9].
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.7.4-1.

Table 7.3.7.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	Disable	

Table 7.3.7.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

In subtest 1 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3).

In subtest 2 the UE shall stop transmitting uplink signal no later than time point C (duration D1 = 6500 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

7.3.8.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

7.3.8.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.8.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.8.

7.3.8.4 Test description

The test consists of one subtest with one cell configured. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.8.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

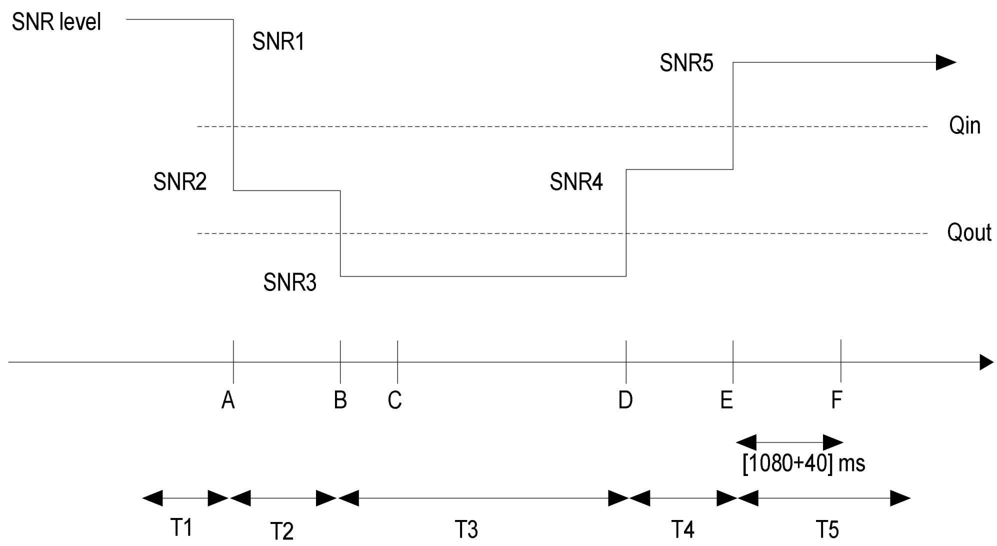

Figure 7.3.8.4-1: SNR variation for in-sync testing in DRX

7.3.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1 Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. The general test parameter settings for the test is set up according to Table 7.3.8.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.8.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.8.4.1-1: General test parameters for E-UTRAN TDD in-sync in DRX testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.6 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Antenna Configuration			1x2	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table 7.3.8.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.8.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.8.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.8.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.8.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.8.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.8.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.8.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.8.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.8.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.8.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.8.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.8.5 Test requirement

Table 7.3.8.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Antenna Configuration		1x2				
Special subframe configuration[Note1]		6				
Uplink-downlink configuration[Note2]		1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA[Note1]	dB					
OCNG_R B[Note1]	dB					
SNR [Note 8]	dB	-4.5	-8.5	-13.7	-9.7	-4.5
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211 [9].
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211 [9].
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.8.4-1.

Table 7.3.8.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.8.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:
- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.9.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.9.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.9.

7.3.9.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.9.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

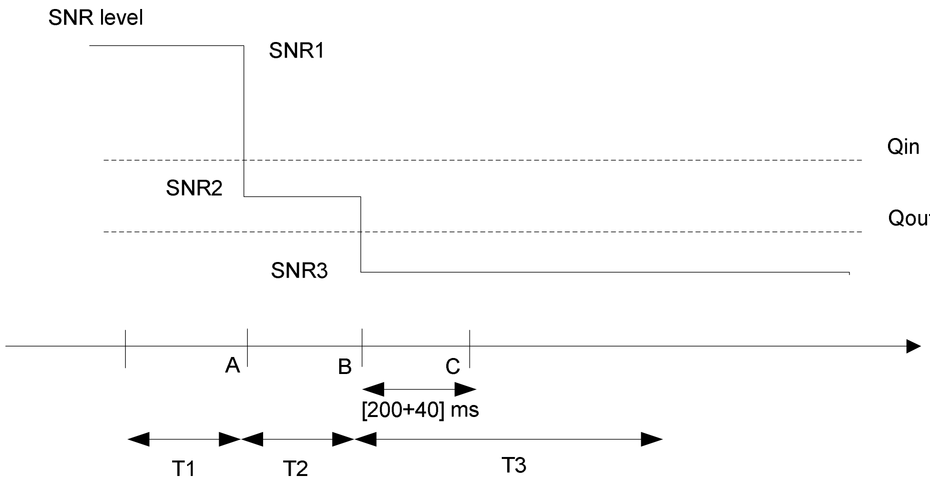

Figure 7.3.9.4-1 SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.9.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.9.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.9.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9.FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	As specified in section D.1.6.
Serving cell (PCell)			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		μs	3	Synchronous cells
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell ID PCI			$(PCI_{cell1}-PCI_{cell2})mod3$!= 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency
ABS pattern			'10000000100000001000 00001000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			'10000000100000001000 00001000000010000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePattern PCell -r10 as defined in TS 36.331, clause 6.3.2.
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel				

7.3.9.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.9.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.9.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.9.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.9.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.9.4.3-1: Common Exception messages for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.9.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.9.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.9.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.9.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	‘1000000010000000100000001000000010000000’	BIT STRING (SIZE (40))	
}			
}			
}			

Table 7.3.9.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.9.5 Test requirements

Table 7.3.9.5-1: Cell specific test requirement parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
OCNG Pattern defined in D.1.6 (FDD)		OP.6 FDD			OP.6 FDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30			ETU 30		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs. Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.9.4-1.							

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.10.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.10.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.10.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.10.

7.3.10.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.10.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

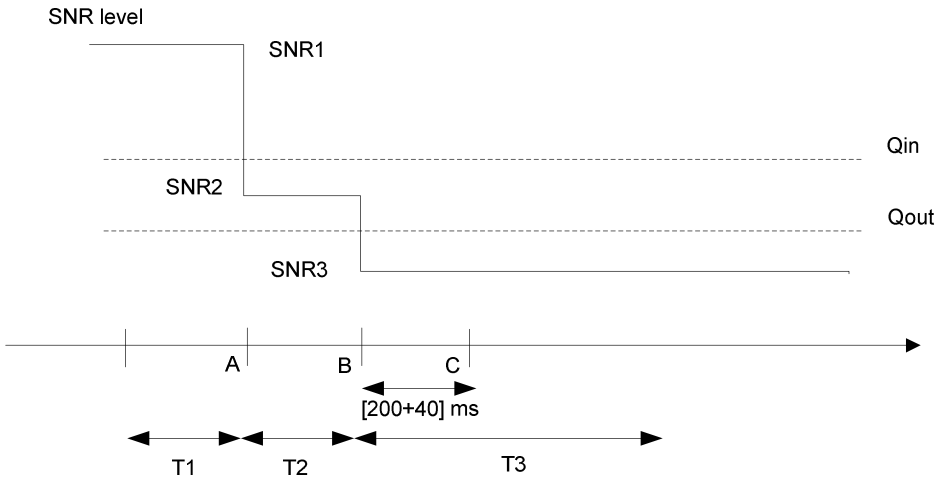

Figure 7.3.10.4-1 SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.10.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.10.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.10.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID PCI			$(PCI_{cell1}-PCI_{cell2})$mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency.
ABS pattern			10000000001000000000	TDD ABS Pattern Info IE is configured in Cell 2 as defined in section 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			10000000001000000000	MeasSubframePattern IE is configured in UE for serving cell measurement as defined in section 6.3.6 in TS 36.331.
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		μs	3	
Propagation channel			ETU30	
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.10.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.10.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.10.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.10.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.10.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.10.4.3-1: Common Exception messages for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.10.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.10.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.10.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.10.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 7.3.10.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.10.5 Test requirements

Table 7.3.10.5-1: Cell specific test requirement parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with non-MBSFN ABS (eICIC)

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Cell 1</th><th colspan="3">Cell 2</th></tr>
<tr><th>T1</th><th>T2</th><th>T3</th><th>T1</th><th>T2</th><th>T3</th></tr>
<tr><td>E-UTRA RF Channel Number</td><td></td><td colspan="3">1</td><td colspan="3">1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="3">10</td><td colspan="3">10</td></tr>
<tr><td>Correlation Matrix and Antenna Configuration</td><td></td><td colspan="3">2x2 Low</td><td colspan="3">2x2 Low</td></tr>
<tr><td>Special subframe configuration[Note1]</td><td></td><td colspan="3">6</td><td colspan="3">6</td></tr>
<tr><td>Uplink-downlink configuration[Note2]</td><td></td><td colspan="3">1</td><td colspan="3">1</td></tr>
<tr><td>OCNG Pattern defined in D.2.2 (TDD)</td><td></td><td colspan="3">OP.2 TDD</td><td colspan="3">OP.2 TDD</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td colspan="3">-3</td><td colspan="3">-3</td></tr>
<tr><td>PCFICH_RB</td><td>dB</td><td colspan="3">1</td><td colspan="3" rowspan="13">Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.</td></tr>
<tr><td>PDCCH_RA</td><td>dB</td><td colspan="3">1</td></tr>
<tr><td>PDCCH_RB</td><td>dB</td><td colspan="3">1</td></tr>
<tr><td>PBCH_RA</td><td>dB</td><td colspan="3" rowspan="10">-3</td></tr>
<tr><td>PBCH_RB</td><td>dB</td></tr>
<tr><td>PSS_RA</td><td>dB</td></tr>
<tr><td>SSS_RA</td><td>dB</td></tr>
<tr><td>PHICH_RA</td><td>dB</td></tr>
<tr><td>PHICH_RB</td><td>dB</td></tr>
<tr><td>PDSCH_RA</td><td>dB</td></tr>
<tr><td>PDSCH_RB</td><td>dB</td></tr>
<tr><td>OCNG_RA[Note 3]</td><td>dB</td></tr>
<tr><td>OCNG_RB[Note 3]</td><td>dB</td></tr>
<tr><td>SNR [Note 8]</td><td>dB</td><td>-0.4</td><td>-4.5</td><td>-13.3</td><td>4.8</td><td>4.8</td><td>5.2</td></tr>
<tr><td>N_{oc}</td><td>dBm/15 kHz</td><td colspan="3">-98</td><td colspan="3">-98</td></tr>
<tr><td>Propagation condition</td><td></td><td colspan="3">ETU30</td><td colspan="3">ETU30</td></tr>
<tr><td colspan="8">Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 of active cell is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.10.4-1.</td></tr>
</table>

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.11.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell.

7.3.11.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.11.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.11.

7.3.11.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.11.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

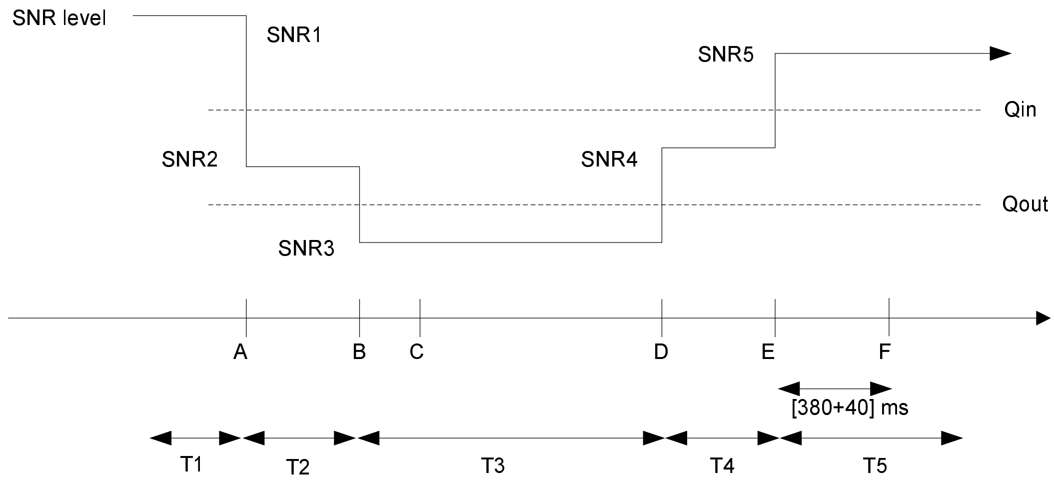

Figure 7.3.11.4-1 SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.11.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.11.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.11.4.1-1: General test parameters for E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	As specified in section D.1.6.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on E-UTRA RF channel number 1; Cell 2 generates interference over restricted resources.
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-2
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters for the active cell (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters for active cell (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		μs	3	
Propagation channel			ETU30	
T1		s	0.5	
T2		s	0.4	

T3	s	1.46	
T4	s	0.4	
T5	s	1	
Physical cell ID PCI		$(PCI_{cell1}-PCI_{cell2})$mod3 != 0	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency
ABS pattern		'100000001 000000010 000000100 000001000 0000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern		'100000001 000000010 000000100 000001000 0000'	Time domain measurement pattern for serving cell measurement signalled to the UE in message measSubframePattern PCell -r10 as defined in TS 36.331, clause 6.3.2.
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.11.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.11.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.11.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.11.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.11.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.11.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.11.4.3-1: Common Exception messages for E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.11.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

TTable 7.3.11.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.11.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.11.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	‘1000000010000000100000001000000010000000’	BIT STRING (SIZE (40))	
}			
}			
}			

7.3.11.5 Test requirements

Table 7.3.11.5-1: Cell specific test requirement parameters for E-UTRAN FDD for in-sync radio link monitoring under time domain measurement resource restriction (eICIC)

Parameter	**Unit**	**Cell 1**					**Cell 2**				
		T1	**T2**	**T3**	**T4**	**T5**	**T1**	**T2**	**T3**	**T4**	**T5**
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
PCFICH/PDCCH/PHICH parameters		R.9 FDD					R.9 FDD				
Number of Control OFDM symbols		3					3				
OCNG Pattern defined D.1.6 (FDD)		OP.6 FDD					OP.6 FDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.11.4-1.											

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)

7.3.12.1 Test purpose

To verify that the UE properly detects in sync for the purpose of monitoring downlink radio link quality of the serving cell.

7.3.12.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.12.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.11.

7.3.12.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.12.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

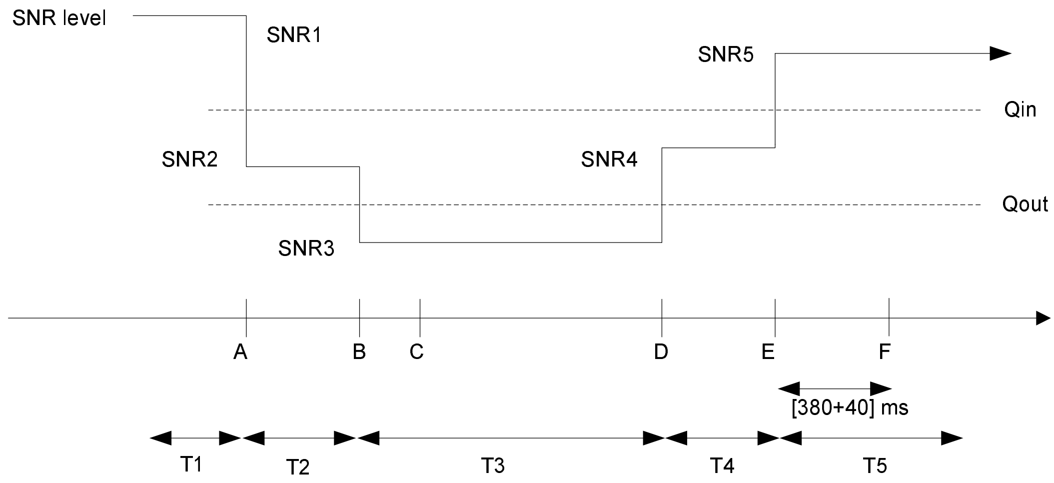

Figure 7.3.12.4-1 SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40
2. The general test parameter settings for the different subtests are set up according to Table 7.3.12.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.12.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.12.4.1-1: General test parameters for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on E-UTRA RF channel number 1; Cell 2 generates interference over restricted resources.
Neighbour cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-2
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters for the active cell (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters for active cell (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		μs	3	
Propagation channel			ETU30	
T1		s	0.5	
T2		s	0.4	

T3	s	1.46	
T4	s	0.4	
T5	s	1	
Physical cell ID PCI		$(PCI_{cell1}-PCI_{cell2})mod3 != 0$	Cell IDs are chosen such that CRS from cells 1 and 2 do not overlap in frequency
ABS pattern		'1000000000 1000000000'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern		'1000000000 1000000000'	Time domain measurement pattern for serving cell measurement signalled to the UE in message measSubframePattern PCell - r10 as defined in TS 36.331, clause 6.3.2. Configured in Cell 1.
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.12.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Non-MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.12.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.12.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.12.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.12.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.12.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.12.4.3-1: Common Exception messages for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.12.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.12.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.12.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.12.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	‘10000000001000000000’	BIT STRING (SIZE (20))	
}			
}			
}			

7.3.12.5 Test requirements

Table 7.3.12.5-1: Cell specific test requirement parameters for E-UTRAN TDD for in-sync radio link monitoring under time domain measurement resource restriction (eICIC)

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
PCFICH/PDCCH/PHICH parameters		R.9 TDD					R.9 TDD				
Number of Control OFDM symbols		3					3				
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR [Note 8]	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8]	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.12.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.13.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.13.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.13.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.13.

7.3.13.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.13.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

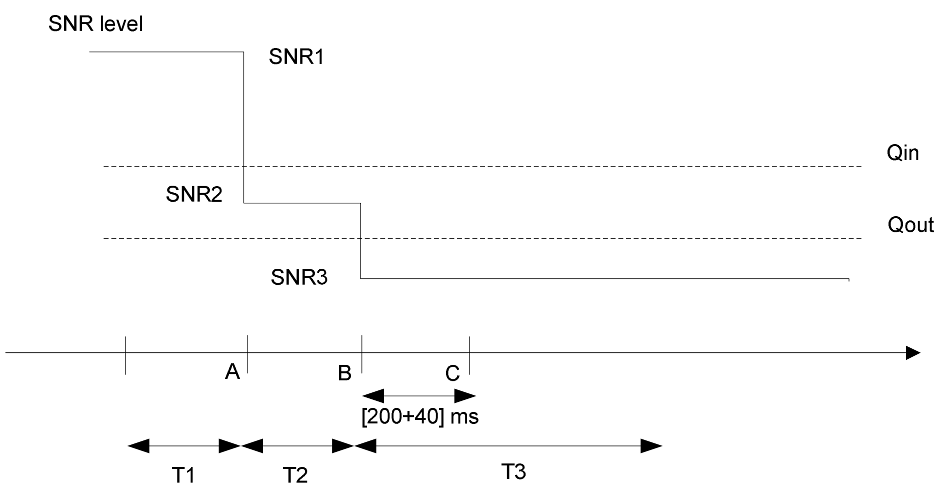

Figure 7.3.13.4-1: SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.13.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.13.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.13.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9.FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD for the serving cell (Cell 1) OP.9 FDD for the neighbour cell (Cell 2)	As specified in section D.1.6 and D.1.9 respectively
Serving cell (PCell)			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		μs	3	Synchronous cells
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2}) mod 3 = 0, PCI_{cell1} not equal to PCI_{cell2}	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency
ABS pattern			'01000000100000001000 00000010000001000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			'01000000100000001000 00000010000001000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePattern-Serv-r10 as defined in TS 36.331, clause 6.3.2.
Note: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.13.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.13.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.13.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.13.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.13.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.13.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.13.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.13.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.13.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.13.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000010000000100000000010000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 7.3.13.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 1
}			

Table 7.3.13.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

Table 7.3.13.4.3-8: *SystemInformationBlockType1 :* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.13.5 Test requirements

Table 7.3.13.5-1: Cell specific test requirement parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
OCNG Pattern defined in D.1.6 (FDD) and D.1.9 (FDD)		OP.6 FDD			OP.9 FDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.13.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.14.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.14.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.14.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.14.

7.3.14.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.14.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

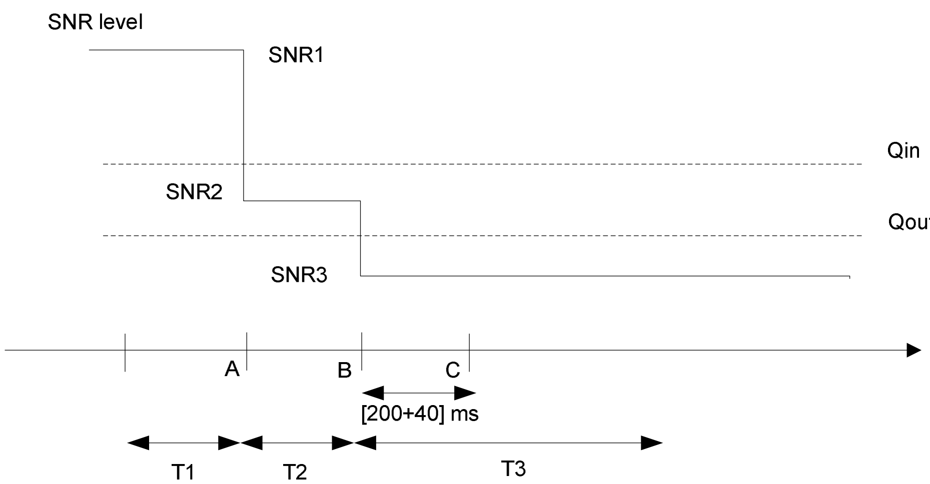

Figure 7.3.14.4-1: SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.14.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.14.4.3.

5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.14.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9.TDD	As specified in clause A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD for the serving cell (Cell 1) OP.6 TDD for the neighbour cell (Cell 2)	As specified in clause D.2.2 and D.2.6 respectively
Serving cell (PCell)			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		μs	3	Synchronous cells
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2}) mod 3 = 0, PCI_{cell1} not equal to PCI_{cell2}	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency
ABS pattern			'00001000000000100000'	MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time domain measurement resource restriction pattern			'00001000000000100000'	Time-domain measurement resource restriction pattern for serving cell measurements signalled to the UE in message measSubframePattern-Serv-r10 as defined in TS 36.331, clause 6.3.2.
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.14.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.14.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.14.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.14.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.14.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.14.4.3-1: Common Exception messages for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.14.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.14.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.14.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.14.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 7.3.14.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	Cell 2
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 7.3.14.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

Table 7.3.14.4.3-8: *SystemInformationBlockType1 :* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2
}			

7.3.14.5 Test requirements

Table 7.3.14.5-1: Cell specific test requirement parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
OCNG Pattern defined in D.2.2 (TDD) and D.2.6 (TDD)		OP.2 TDD			OP.6 TDD		
ρ_A, ρ_B		-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-1.		
PDCCH_RA	dB	1					
PDCCH_RB	dB	1					
PBCH_RA	dB	-3					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note3]	dB						
OCNG_RB[Note3]	dB						
SNR [Note 7,8]	dB	-0.4	-4.5	-13.3	4.8	4.8	5.2
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink subframe configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 8: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in Figure 7.3.14.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.15.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell.

7.3.15.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.15.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.15.

7.3.15.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.15.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

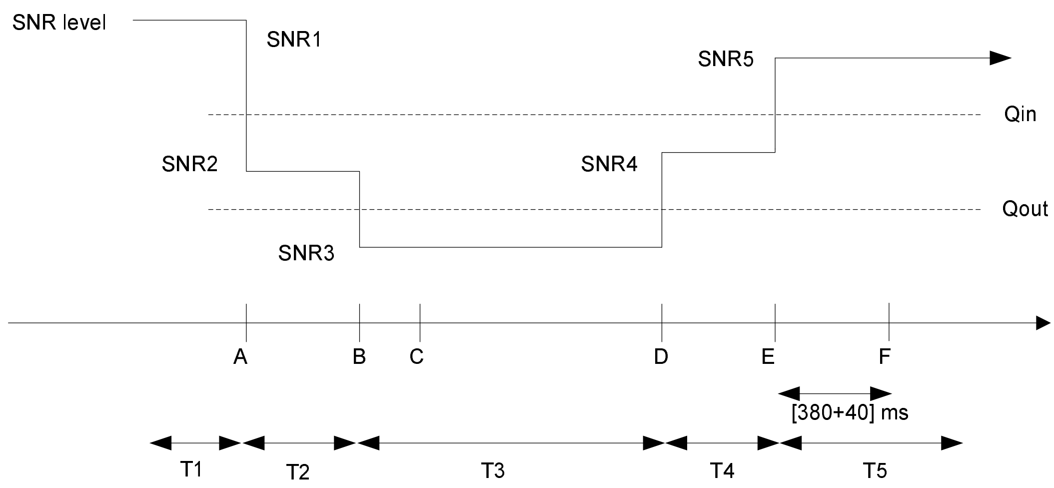

Figure 7.3.15.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.15.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.15.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.15.4.1-1: General test parameters for E-UTRAN FDD in-sync testing under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test.
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
OCNG parameters for Cell 1			OP.6 FDD	As specified in section D.1.6.
OCNG parameters for Cell 2			OP.9 FDD	As specified in section D.1.9.
CP length			Normal	
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-2
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID PCI			$(PCI_{cell1}-PCI_{cell2})$ mod 3 = 0, PCIcell1 not equal to PCIcell2	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency.
ABS pattern			01000000100000001000000000010000001000000	FDD ABS Pattern Info IE is configured in Cell 2 as defined in section 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time domain measurement			01000000100000001000	MeasSubframePattern IE is

resource restriction pattern		0000010000001000000	configured in UE for serving cell measurement as defined in section 6.3.6 in TS 36.331.
DRX		OFF	
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	2	Minimum CQI reporting periodicity
Time offset between cells	μs	3	
Propagation channel		ETU30	
T1	s	0.5	
T2	s	0.4	
T3	s	1.46	
T4	s	0.4	
T5	s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.15.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.15.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.15.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.15.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.15.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.15.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.15.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.15.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.15.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.15.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.15.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'01000000100000001000 00000010000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 7.3.15.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 1
}			

Table 7.3.15.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

7.3.15.5 Test requirements

Table 7.3.15.5-1: Cell specific test requirement parameters for E-UTRAN FDD for in-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS (eICIC)

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
OCNG Pattern defined in D.1.6 (FDD) and D.1.9 (FDD)		OP.6 FDD					OP.9 FDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: OCNG shall be used such that the resources in Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.15.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

7.3.16.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction.

7.3.16.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

7.3.16.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.16.

7.3.16.4 Test description

There are two E-UTRA cells in the test on the same RF channel. Cell 1 is the serving victim cell and Cell 2 is the neighbour aggressor cell. MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.16.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate in-sync states.

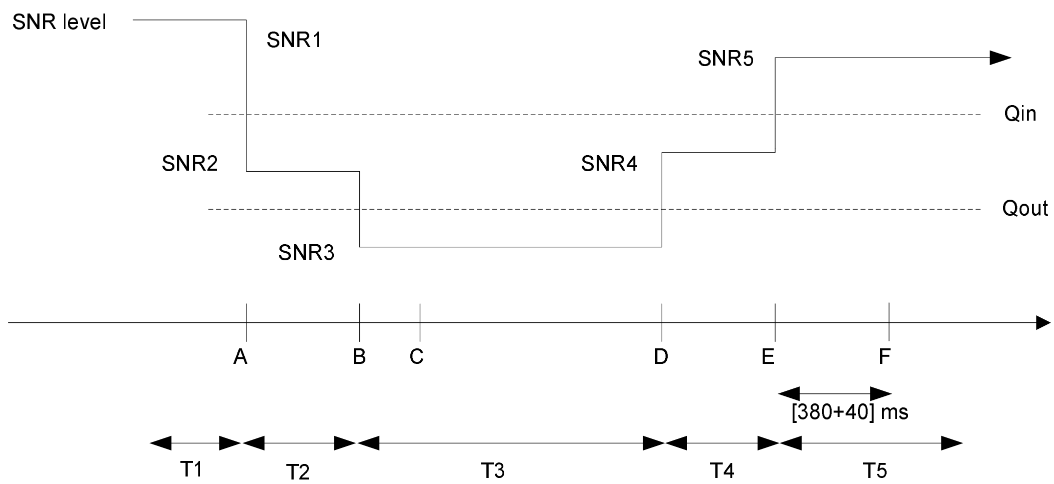

Figure 7.3.16.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.40.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.16.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.16.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.16.4.1-1: General test parameters for E-UTRAN TDD in-sync testing under time domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.9 TDD	As specified in clause A.2.2. None of the PDCCH are intended for the UE under test
Serving cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbour cell			Cell 2	Cell 2 is the aggressor cell on E-UTRA RF channel number 1
Neighbour cell ABS configuration			MBSFN ABS	As defined in Table C.3.1.2.2-2
OCNG parameters for Cell 1			OP.2 TDD	As specified in clause D.2.2.
OCNG parameters for Cell 2			OP.6 TDD	As specified in clause D.2.6.
CP length			Normal	
Neighbour cell ABS configuration			MBSFN ABS	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	-3	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Physical cell ID PCI			(PCI_{cell1}-PCI_{cell2}) mod 3 = 0, PCIcell1 not equal to PCIcell2	Cell IDs are chosen such that CRS from cells 1 and 2 overlap in frequency.
ABS pattern			00001000000000100000	TDD ABS Pattern Info IE is configured in Cell 2 as defined in clause 9.2.54 in TS 36.423 [28]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time domain measurement			00001000000000100000	MeasSubframePattern IE is

resource restriction pattern			configured in UE for serving cell measurement as defined in clause 6.3.6 in TS 36.331.
DRX		OFF	
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	1	Minimum CQI reporting periodicity
Time offset between cells	μs	3	
Propagation channel		ETU30	
T1	s	0.5	
T2	s	0.4	
T3	s	1.46	
T4	s	0.4	
T5	s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.			

7.3.16.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

MBSFN ABS pattern is configured in the aggressor cell (Cell 2). The UE is configured by higher layers with a time domain measurement restriction pattern for performing serving cell (Cell 1) measurements. The patterns shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 7.3.16.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.16.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.16.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.16.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.16.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.16.4.3-1: Common Exception messages for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.16.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.16.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.16.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.16.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 7.3.16.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	Cell 2
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 7.3.16.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2

7.3.16.5 Test requirements

Table 7.3.16.5-1: Cell specific test parameters for E-UTRAN TDD for in-sync radio link monitoring under time domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Cell 1					Cell 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.2.2 (TDD) and D.2.6 (TDD)		OP.2 TDD					OP.6 TDD				
ρ_A, ρ_B		-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.				
PDCCH_RA	dB	-3									
PDCCH_RB	dB	-3									
PBCH_RA	dB	-3									
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 1]	dB										
OCNG_RB[Note 1]	dB										
SNR [Note 8]	dB	-0.4	-4.5	-13.3	-8.2	-0.4	4.8	4.8	5.2	5.2	4.8
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU30					ETU30				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of the active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.16.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.17.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information.

7.3.17.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.17.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.17.

7.3.17.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.17.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

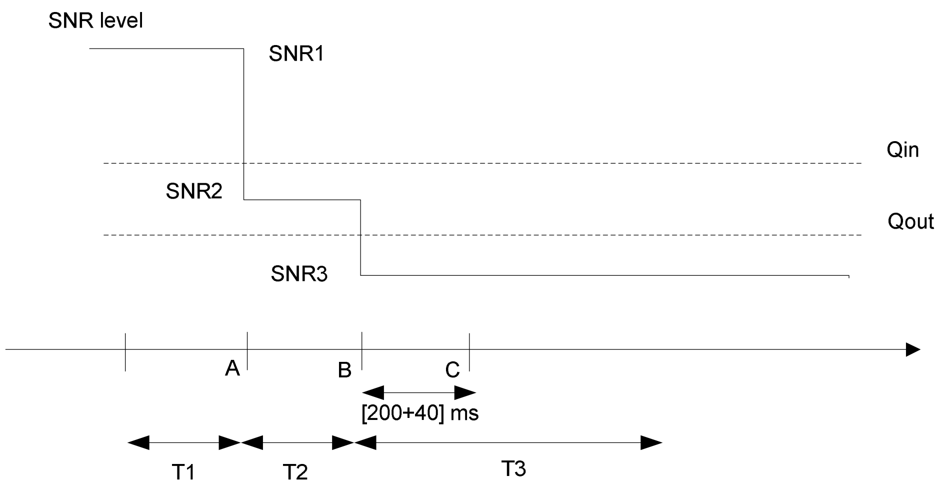

Figure 7.3.17.4-1: SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

7.3.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.17.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.17.4.3

5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.17.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.7 FDD	As specified in clause A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	As specified in section D.1.6.
PCell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cells			Cell 2 and Cell 3	Both of aggressor cells on E-UTRA RF channel number 1
Neighbor cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Time offset between cells		µs	Cell 2 time offset with respect to Cell 1: 3 Cell 3 time offset with respect to Cell 1: 2	Three synchronous cells
Frequency shift between cells		Hz	Cell 2 frequency shift with respect to Cell 1: 300 Cell 3 frequency shift with respect to Cell 1: -100	
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell IDs			$(PCI_{cell1}-PCI_{cell2})$mod3 = 0 $(PCI_{cell1}-PCI_{cell3})$mod3!= 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that all conditions are met
ABS pattern			'1000000010000000100000001000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.

Time domain measurement resource restriction pattern			'1000000010000000100000001000000010000000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 and Cell 3 in *CRS-AssistanceInfo*. It includes a single *MBSFN-SubframeConfig* element with subframe allocation *oneFrame*='000000'
	antennaPortsCount		an2	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel				

7.3.17.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.
2. Set the parameters for Cell 1, Cell 2 and Cell 3 according to T1 in Table 7.3.17.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.17.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.17.5-1. T3 starts.
5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.17.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.17.4.3-1: Common Exception messages for E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.17.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.17.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.17.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.17.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'10000000100000001000 00001000000010000000'	BIT STRING (SIZE (40))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	$(PCI_{cell1}-PCI_{cell2})$ mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	$(PCI_{cell1}-PCI_{cell3})$ mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for for	

		Cell3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.17.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN FDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2, Cell 3
}			

7.3.17.5 Test requirements

Table 7.3.17.5-1: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Cell 1</th><th colspan="3">Cell 2</th><th colspan="3">Cell 3</th></tr>
<tr><th>T1</th><th>T2</th><th>T3</th><th>T1</th><th>T2</th><th>T3</th><th>T1</th><th>T2</th><th>T3</th></tr>
<tr><td>E-UTRA RF Channel Number</td><td></td><td colspan="3">1</td><td colspan="3">1</td><td colspan="3">1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="3">10</td><td colspan="3">10</td><td colspan="3">10</td></tr>
<tr><td>Correlation Matrix and Antenna Configuration</td><td></td><td colspan="3">2x2 Low</td><td colspan="3">2x2 Low</td><td colspan="3">2x2 Low</td></tr>
<tr><td>OCNG Pattern defined in D.1.6 (FDD)</td><td></td><td colspan="3">OP.6 FDD</td><td colspan="3">OP.6 FDD</td><td colspan="3">OP.6 FDD</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td colspan="3">-3</td><td colspan="3">-3</td><td colspan="3">-3</td></tr>
<tr><td>PCFICH_RB</td><td>dB</td><td colspan="3">1</td><td colspan="3" rowspan="13">Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.</td><td colspan="3" rowspan="13">Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1</td></tr>
<tr><td>PDCCH_RA</td><td>dB</td><td colspan="3">1</td></tr>
<tr><td>PDCCH_RB</td><td>dB</td><td colspan="3">1</td></tr>
<tr><td>PBCH_RA</td><td>dB</td><td colspan="3" rowspan="10">-3</td></tr>
<tr><td>PBCH_RB</td><td>dB</td></tr>
<tr><td>PSS_RA</td><td>dB</td></tr>
<tr><td>SSS_RA</td><td>dB</td></tr>
<tr><td>PHICH_RA</td><td>dB</td></tr>
<tr><td>PHICH_RB</td><td>dB</td></tr>
<tr><td>PDSCH_RA</td><td>dB</td></tr>
<tr><td>PDSCH_RB</td><td>dB</td></tr>
<tr><td>OCNG_RA Note1</td><td>dB</td></tr>
<tr><td>OCNG_RB Note1</td><td>dB</td></tr>
<tr><td>SNR Note 6</td><td>dB</td><td>-0.6</td><td>-4.3</td><td>-14.6</td><td>3.8</td><td>3.8</td><td>4.2</td><td>1.8</td><td>1.8</td><td>2.2</td></tr>
<tr><td>N_{oc}</td><td>dBm/15 kHz</td><td colspan="3">-98</td><td colspan="3">-98</td><td colspan="3">-98</td></tr>
<tr><td>Propagation condition</td><td></td><td colspan="3">ETU 30 Hz</td><td colspan="3">ETU 30 Hz</td><td colspan="3">ETU 30 Hz</td></tr>
<tr><td colspan="11">Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 6: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.17.4-1.</td></tr>
</table>

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.18.1 Test purpose

To verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information.

7.3.18.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.18.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Qout, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200 ms Qout evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.18.

7.3.18.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms. The non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.18.4-1 shows the variation of the downlink SNR in the serving cell (Cell 1) to emulate out-of-sync states.

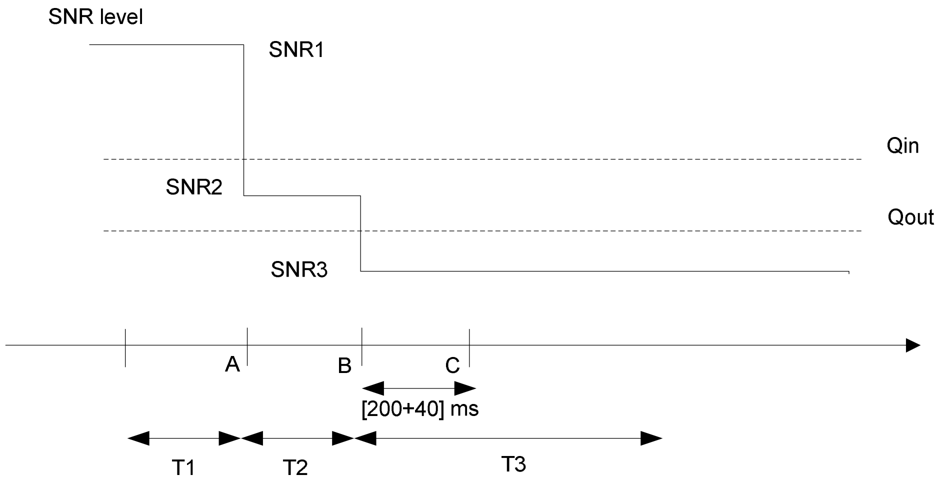

Figure 7.3.18.4-1:SNR variation in the serving cell for out-of-sync testing under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

7.3.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.18.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.18.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.18.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.7.TDD	As specified in clause A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in clause D.2.2
PCell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
Neighbor cells			Cell 2 and Cell 3	Both of aggressor cells on E-UTRA RF channel number 1
Neighbor cell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.2-1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters:: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Time offset between cells		μs	Cell 2 time offset with respect to Cell 1: 3 Cell 3 time offset with respect to Cell 1: 2	Three synchronous cells
Frequency shift between cells		Hz	Cell 2 frequency shift with respect to Cell 1: 300 Cell 3 frequency shift with respect to Cell 1: -100	
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Physical cell IDs			$(PCI_{cell1}-PCI_{cell2})mod3 = 0$ $(PCI_{cell1}-PCI_{cell3})mod3 != 0$ PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that all conditions are met
ABS pattern			'00001000000000100000'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.

Time domain measurement resource restriction pattern			'00001000000000100000'	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in *CRS-AssistanceInfo*. It includes a single *MBSFN-SubframeConfig* element with subframe allocation *oneFrame*='000000'
	antennaPortsCount		an2	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel				

7.3.18.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.
2. Set the parameters for Cell 1, Cell 2 and Cell 3 according to T1 in Table 7.3.18.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.18.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.18.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR values to T1 as specified in Table 7.3.18.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.18.4.3-1: Common Exception messages for E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1 Table H.2.7-1
Default RRC messages and information elements contents exceptions	

Table 7.3.18.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.18.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.18.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.18.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	$(PCI_{cell1}\text{-}PCI_{cell2})$ mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	$(PCI_{cell1}\text{-}PCI_{cell3})$ mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is	

		provided for for Cell3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.18.4.3-6: *SystemInformationBlockType1 :* Additional E-UTRAN TDD out-of-sync testing under time domain measurement resource restriction with non-MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.2 Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
cellSelectionInfo SEQUENCE {			
q-RxLevMin	-35 (-70 dBm)		Cell 2, Cell 3
}			

7.3.18.5 Test requirements

Table 7.3.18.5-1: Cell specific test requirement parameters for E-UTRAN TDD for out-of-sync radio link monitoring under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS (feICIC)

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1			1		
$BW_{channel}$	MHz	10			10			10		
Special subframe configuration[Note1]		6			6			6		
Uplink-downlink configuration[Note2]		1			1			1		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low			2x2 Low		
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD			OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			-3			-3		
PCFICH_RB	dB	1			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.			Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-1.		
PDCCH_RA	dB	1								
PDCCH_RB	dB	1								
PBCH_RA	dB	-3								
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA[Note1]	dB									
OCNG_RB[Note1]	dB									
SNR [Note 6]	dB	-0.6	-4.3	-14.6	3.8	3.8	4.2	1.8	1.8	2.2
N_{oc}	dBm/15 kHz	-98			-98			-98		
Propagation condition		ETU 30 Hz			ETU 30 Hz			ETU 30 Hz		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink subframe configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal quality, signal-to-interference-plus-noise ratio, on the CRS REs.
Note 8: The SNR in the restricted measurement subframes during time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in Figure 7.3.18.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after the start of the time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.19.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell under time domain measurement resource restriction with CRS assistance information.

7.3.19.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.19.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.19.

7.3.19.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.19.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

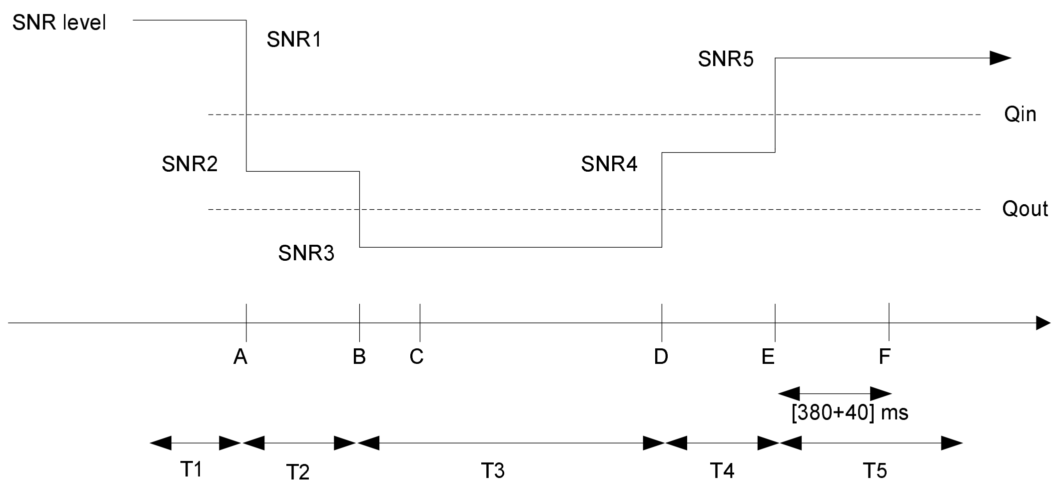

Figure 7.3.19.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.19.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.19.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.19.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.19.4.1-1: General test parameters for E-UTRAN FDD in-sync radio link monitoring test (feICIC)

Parameter		Unit	Value			Comment
			Test 1			
			Cell 1	Cell 2	Cell 3	
PCFICH/PDCCH/PHICH parameters			R.9 FDD	R.9 FDD	R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	OP.6 FDD	OP.6 FDD	As specified in section D.1.6
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Neighbor Cell ABS configuration			N/A	Non-MBSFN ABS		As defined in Table C.3.1.1.2-2.
ABS Pattern			N/A	1000000010 0000001000 0000100000 0010000000	1000000010 0000001000 0000100000 0010000000	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in both Cell 2 and Cell 3 prior to the start of T1.
Time domain measurement resource restriction pattern			'100000001 0000000100 0000010000 0001000000 0'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistant information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'
	antennaPorts Count			an2	an2	
	mbsfn-SubframeConfigList			oneFrame = '000000'	oneFrame = '000000'	
Time offset between cells (With respect to Cell 1)		us	0	3	2	
Frequency shift between cells (With respect to Cell 1)		Hz	0	300	-100	
Physical Cell ID			PCI_{cell1}	$(PCI_{cell1}-PCI_{cell2})$ mod3 = 0	$(PCI_{cell1}-PCI_{cell3})$ mod3! = 0	Cell PCIs are selected so that all conditions are met

<table>
<tr><td colspan="2"></td><td></td><td></td><td>PCI_{cell1} not equal to PCI_{cell2}</td><td></td><td></td></tr>
<tr><td colspan="2">In sync transmission parameters (Note 1)</td><td>DCI format</td><td>1C</td><td>1C</td><td>1C</td><td></td></tr>
<tr><td rowspan="5">In sync transmission parameters (Note 1)</td><td>Number of Control OFDM symbols</td><td></td><td>3</td><td>3</td><td>3</td><td>As defined in section 5.3.3.1.4 in TS 36.212</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>4</td><td>4</td><td>4</td><td rowspan="5">In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>-3</td><td>-3</td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td></td><td>-3</td><td colspan="2" rowspan="2">Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td></td><td>1</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>1A</td><td>1A</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>3</td><td>3</td><td>3</td><td>As defined in section 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td><td>8</td><td>8</td><td rowspan="4">Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>-3</td><td>-3</td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>1</td><td colspan="2" rowspan="2">Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>1</td></tr>
<tr><td colspan="2">DRX</td><td></td><td>OFF</td><td>OFF</td><td>OFF</td><td></td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Disable</td><td>Disable</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>2000</td><td colspan="2" rowspan="4">N/A</td><td>T310 is enabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213.</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>2</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>0.5</td><td colspan="2" rowspan="5">N/A</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>0.4</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>1.46</td><td></td></tr>
<tr><td colspan="2">T4</td><td>s</td><td>0.4</td><td></td></tr>
<tr><td colspan="2">T5</td><td>s</td><td>1</td><td></td></tr>
<tr><td colspan="7">Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.19.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.19.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.19.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.19.5-1. T3 starts.

5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.19.5-1. T4 starts.

6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.19.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.19.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.19.4.3-1: Common Exception messages for E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2 Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	

Table 7.3.19.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.19.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.19.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.19.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5 Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	The CRS assistance information is	

		provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

7.3.19.5 Test requirements

Table 7.3.19.5-1: Cell specific test requirement parameters for E-UTRAN FDD for in-sync radio link monitoring (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
PCFICH/PDCCH/PHICH parameters		R.9 FDD					R.9 FDD					R.9 FDD				
OCNG Pattern defined in D.1.6 (FDD)		OP.6 FDD					OP.6 FDD					OP.6 FDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 1	dB															
OCNG_RB Note 1	dB															
SNR Note 6	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

Note 1: OCNG shall be used such that the resources in cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.19.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)

7.3.20.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the Pcell under time domain measurement resource restriction with CRS assistance information.

7.3.20.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.20.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.20.

7.3.20.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.20.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

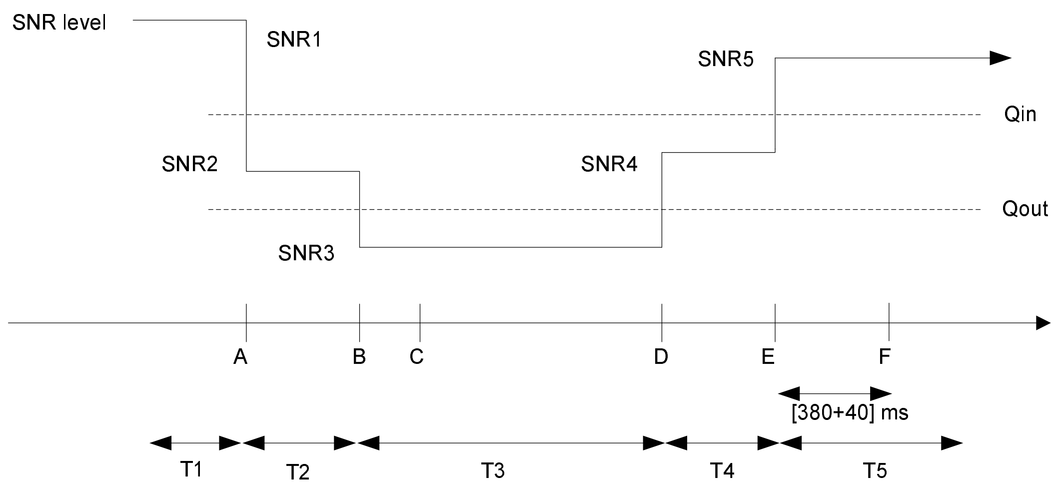

Figure 7.3.20.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with non-MBSFN ABS

7.3.20.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.20.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.20.4.3
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.20.4.1-1: General test parameters for E-UTRAN TDD in-sync radio link monitoring test (feICIC)

Parameter		Unit	Value			Comment
			Test 1			
			Cell 1	Cell 2	Cell 3	
PCFICH/PDCCH/PHICH parameters			R.9 TDD	R.9 TDD	R.9 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Neighbor Cell ABS configuration			N/A	Non-MBSFN ABS		As defined in Table C.3.1.1.2-2
ABS Pattern			N/A	'000010000 0000010000 0'	'000010000 0000010000 0'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 2 and Cell 3. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern			'000010000 0000010000 0'	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistant information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'
	antennaPorts Count			an2	an2	
	mbsfn-SubframeConfigList			oneFrame = '000000'	oneFrame = '000000'	
Time offset from Cell 1		us	0	3	2	
Frequency offset		Hz	0	300	-100	
Physical Cell ID			PCI_{cell1}	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to	(PCI_{cell1}-PCI_{cell3}) mod3 != 0	Cell PCIs are selected so that all conditions are met

				PCI_{cell2}		
In sync transmission parameters (Note 1)	DCI format		1C	1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		3	3	3	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	4	
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.		
	Ratio of PCFICH to RS EPRE		1			
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		3	3	3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.		
	Ratio of PCFICH to RS EPRE	dB	1			
DRX			OFF	OFF	OFF	
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	N/A		T310 is enabled
T311 timer		ms	1000			T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1			Minimum CQI reporting periodicity
T1		s	0.5	N/A		
T2		s	0.4			
T3		s	1.46			
T4		s	0.4			
T5		s	1			
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.						

7.3.20.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

Non-MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The Non-MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.20.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.20.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.20.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.20.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.20.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.20.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.20.4.3-1: Common Exception messages for E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.20.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.20.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.20.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.20.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD in-sync testing under time domain measurement resource restriction (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	‘00001000000000100000’	BIT STRING (SIZE (20))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	$(PCI_{cell1}-PCI_{cell2})$ mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	‘000000’	The CRS assistance information is provided for Cell2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame=’000000’	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	$(PCI_{cell1}-PCI_{cell3})$ mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	‘000000’	The CRS assistance information is	

		provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation oneFrame='000000'	
}			
}			
}			
}			
}			
}			
}			
}			

7.3.20.5 Test requirements

Table 7.3.20.5-1: Cell specific test requirement parameters for E-UTRAN TDD for in-sync radio link monitoring (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
Special subframe configuration Note 1		6					6					6				
Uplink-downlink configuration Note 2		1					1					1				
PCFICH/PDCCH/ PHICH parameters		R.9 TDD					R.9 TDD					R.9 TDD				
OCNG Pattern defined in D.2.2 (TDD)		OP.2 TDD					OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.2-2.									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 3	dB															
OCNG_RB Note 3	dB															
SNR Note 8	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.20.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)

7.3.21.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction with CRS assistance information.

7.3.21.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.21.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.21.

7.3.21.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.21.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

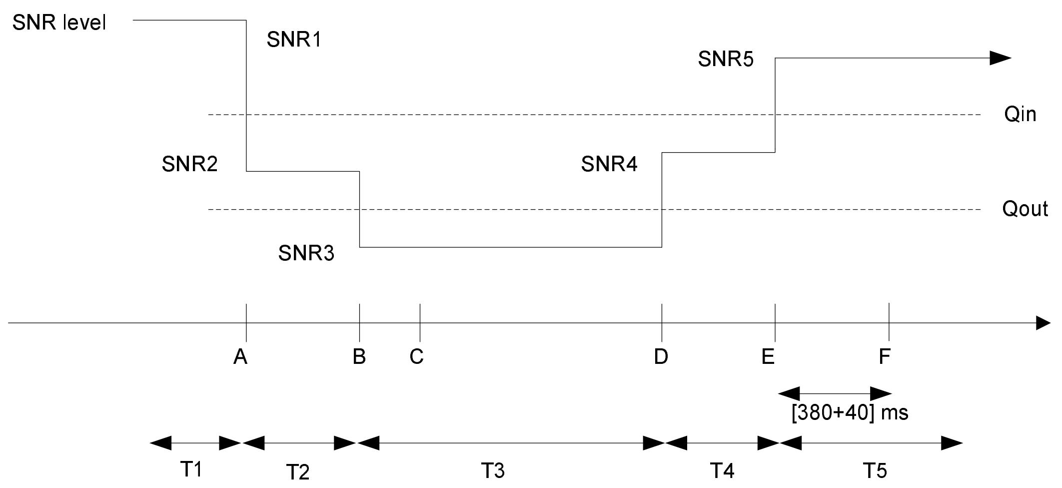

Figure 7.3.21.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.21.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.21.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.21.4.1-1: General test parameters for E-UTRAN FDD in-sync testing radio link monitoring test (feICIC)

Parameter		Unit	Value			Comment
			Test 1			
			Cell 1	Cell 2	Cell 3	
PCFICH/PDCCH/PHICH parameters			R.9 FDD	R.9 FDD	R.9 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.6 FDD	OP.9 FDD	OP.9 FDD	As specified in section D.1.6 and D.1.9.
Active cell			PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 and Cell 3 are on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	2x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Neighbor Cell ABS configuration			N/A	MBSFN ABS		As defined in Table C.3.1.2.2-2.
ABS Pattern			N/A	0100000010 0000001000 0000001000 0001000000	0100000010 0000001000 0000001000 0001000000	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. MBSFN subframes are configured in the ABS subframes configured in Cell 2 and Cell 3 prior to the start of T1.
Time domain measurement resource restriction pattern			‘010000001 0000000100 0000000100 0000100000 0’	N/A	N/A	Time domain measurement resource restriction pattern for serving cell measurement signalled to the UE in message measSubframePatternPCell-r10 as defined in TS 36.331, clause 6.3.2.
CRS assistance information	physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assistance information is provided for Cell 2 and Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrames = ‘100001000100000100001000’
	antennaPortsCount			an2	an2	
	mbsfn-SubframeConfigList			fourFrames = ‘100001000 1000001000 01000’	fourFrames = ‘100001000 1000001000 01000’	
Time offset between cells (With respect to Cell 1)		us	0	3	2	
Frequency shift between cells (With respect to Cell 1)		Hz	0	300	-100	
Physical Cell ID			PCI_{cell1}	(PCI_{cell1}-PCI_{cell2})	(PCI_{cell1}-PCI_{cell3})	Cell PCIs are selected so that all conditions are met

				mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	mod3 != 0	
In sync transmission parameters (Note 1)		DCI format	1C	1C	1C	
In sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.4 in TS 36.212
	Aggregation level	CCE	4	4	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-2 respectively.
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
	Ratio of PCFICH to RS EPRE		1			
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	
	Number of Control OFDM symbols		3	3	3	As defined in section 5.3.3.1.3 in TS 36.212
	Aggregation level	CCE	8	8	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] section 7.6.1 and Table 7.6.1-1 respectively.
	ρ_A, ρ_B		-3	-3	-3	
	Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
	Ratio of PCFICH to RS EPRE	dB	1			
DRX			OFF	OFF	OFF	
Layer 3 filtering			Enabled	Disable	Disable	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	N/A		T310 is enabled
T311 timer		ms	1000			T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0			As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2			Minimum CQI reporting periodicity
T1		s	0.5	N/A		
T2		s	0.4			
T3		s	1.46			
T4		s	0.4			
T5		s	1			
NOTE 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.						

7.3.21.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.21.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.21.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.21.5-1. T3 starts.

5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.21.5-1. T4 starts.

6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.21.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.21.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.21.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.21.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC) requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.21.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.21.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.21.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000010000000100000000010000001000000'	BIT STRING (SIZE (40))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'100001000100000100001000'	The CRS assistance information is provided for Cell 2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams=' 100001000100000100001000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'10000100010000010000	The CRS	

	1000'	assistance information is provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams=' 100001000100000100001000'	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.21.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 1
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 2, Cell 3
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'100001000100000100001000'B		
}			
}			

Table 7.3.21.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3

7.3.21.5 Test requirements

Table 7.3.21.5-1: Cell specific test parameters for E-UTRAN TDD in-sync radio link monitoring test (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
PCFICH/PDCCH/PHICH parameters		R.9 FDD					R.9 FDD					R.9 FDD				
OCNG Pattern defined in D.1.6 and D.1.9 (FDD)		OP.6 FDD					OP.9 FDD					OP.9 FDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 1	dB															
OCNG_RB Note 1	dB															
SNR Note 6	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

NOTE 1: OCNG shall be used such that the resources in cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
NOTE 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
NOTE 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
NOTE 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
NOTE 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.21.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)

7.3.22.1 Test purpose

To verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell under time domain measurement resource restriction with CRS assistance information.

7.3.22.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

7.3.22.3 Minimum conformance requirements

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in TS 36.213 [8] clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] clause 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2.1 and A.7.3.22.

7.3.22.4 Test description

There are three E-UTRA cells in the test on the same RF channel. There are three active cells in the test: Cell 1 is the PCell cell and Cell 2 and Cell 3 are the neighbour cells. MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell measurements. The UE is also configured for periodic CQI reporting in PUCCH 1-0 mode with periodicity of 2 ms.

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.22.4-1 shows the variation of the downlink SNR in the active cell (Cell 1) to emulate in-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1

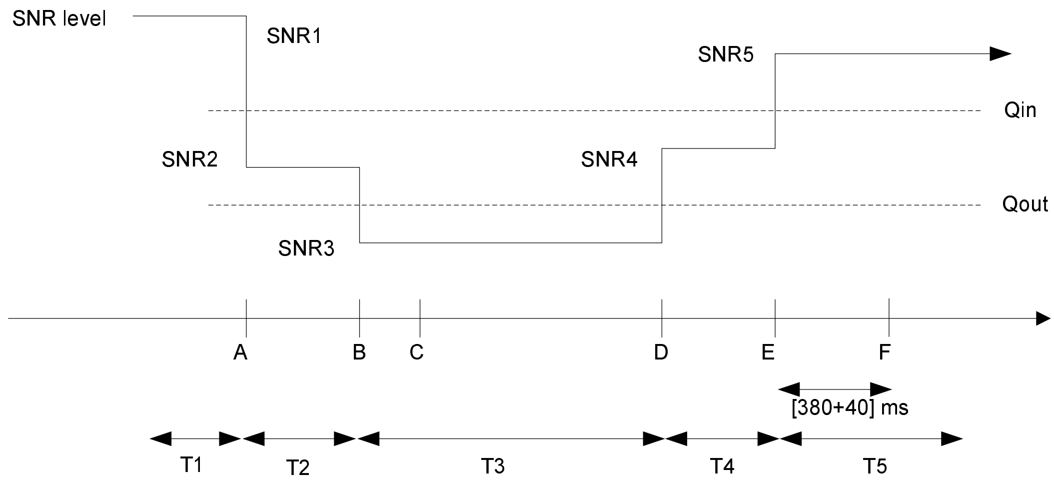

Figure 7.3.22.4-1: SNR variation in the serving cell for in-sync testing under time domain measurement resource restriction with MBSFN ABS

7.3.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.48.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.22.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.22.4.3.
5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 7.3.22.4.1-1: General test parameters for E-UTRAN TDD in-sync radio link monitoring test

ameter	Unit	Value			Comi
		Test 1			
		Cell 1	Cell 2	Cell 3	
H/PHICH		R.9 TDD	R.9 TDD	R.9 TDD	As specified in s None of the PD intended for the
ters		OP.2 TDD	OP.6 TDD	OP.6 TDD	As specified in s and D.2.6.
		PCell	Neighbor Cell	Neighbor Cell	Cell 1, Cell 2 an E-UTRA RF cha
		Normal	Normal	Normal	
annel Number		1	1	1	One E-UTRA TI frequency is use
el Bandwidth	MHz	10	10	10	
rix and Antenna		2x2 Low	2x2 Low	2x2 Low	Correlation Matr Antenna Config defined in TS 36 Annex B.2.3.2
BS configuration		N/A	MBSFN ABS		As defined in Ta
		N/A	00001000000000100000	00001000000000100000	TDD ABS Patte defined in TS 36 clause 9.2.54. C Cell 2 and Cell 3 The first/leftmos corresponds to t subframe #0 of satisfying SFN r where x is the s string (20) divide MBSFN subfran configured in the subframes.
easurement tion pattern		‘00001000000000100000’	N/A	N/A	Time domain m resource restric serving cell mea signalled to the measSubframeI r10 as defined in clause 6.3.2.
physCellId		N/A	see PCI conditions below	see PCI conditions below	The CRS assist information is pr 2 and Cell 3 in C AssistanceInfo. single MBSFN-SubframeConfig subframe alloca fourFrames = ‘010000100001
antennaPortsCount			an2	an2	
mbsfn-SubframeConfigList			fourFrames = ‘010000100001000010000000’	fourFrames = ‘010000100001000010000000’	
n Cell 1	us	0	3	2	
et	Hz	0	300	-100	
)		PCI_{cell1}	$(PCI_{cell1}-PCI_{cell2})$ mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	$(PCI_{cell1}-PCI_{cell3})$ mod3 != 0	Cell PCIs are se all conditions ar
DCI format		1C	1C	1C	As defined in se in TS 36.212
Number of Control OFDM symbols		2	2	2	In sync threshol corresponding h PDCCH/PCFICH parameters are TS 36.133 [4] se and Table 7.6.1
Aggregation level	CCE	4	4	4	
ρ_A, ρ_B		-3	-3	-3	
Ratio of PDCCH to RS EPRE		-3	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
Ratio of PCFICH to RS EPRE		1			
DCI format		1A	1A	1A	As defined in se

					in TS 36.212
Number of Control OFDM symbols		2	2	2	Out of sync thre the correspondi PDCCH/PCFICI parameters are TS 36.133 [4] s and Table 7.6.1
Aggregation level	CCE	8	8	8	
ρ_A, ρ_B		-3	-3	-3	
Ratio of PDCCH to RS EPRE	dB	1	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2.		
Ratio of PCFICH to RS EPRE	dB	1			
		OFF	OFF	OFF	
		Enabled	Disable	Disable	Counters: N310 = 1; N311
	ms	2000	N/A		T310 is enablec
	ms	1000			T311 is enablec
porting mode		PUCCH 1-0			As defined in Ta TS 36.213
eriodicity	ms	1			Minimum CQI re periodicity
	s	0.5	N/A		
	s	0.4			
	s	1.46			
	s	0.4			
	s	1			

CH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Chan

7.3.22.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

MBSFN ABS pattern is configured in both Cell 2 and Cell 3 in this test. The UE is configured by higher layers with a time domain measurement restriction pattern for performing PCell (Cell 1) measurements. The MBSFN ABS pattern, the time domain measurement resource restriction pattern and the CRS assistance information shall be configured prior to the start of T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.
2. Set the parameters for Cell 1, Cell 2, and Cell 3 according to T1 in Table 7.3.22.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR values to T2 as specified in Table 7.3.22.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR values to T3 as specified in Table 7.3.22.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR values to T4 as specified in Table 7.3.22.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR values to T5 as specified in Table 7.3.22.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 7.3.22.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.22.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC) requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.22.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.22.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

Table 7.3.22.4.3-5: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup SEQUENCE {			
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11 {		2 Entries	
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell2}) mod3 = 0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that both conditions are met for Cell2	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'010000100001000010000000'	The CRS assistance information is provided for Cell 2 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams= '010000100001000010000000'	
}			
}			
}			
}			
CRS-AssistanceInfo-r11 :: = SEQUENCE {			
physCellId-r11	(PCI_{cell1}-PCI_{cell3}) mod3! = 0	Cell PCIs are selected so that both conditions are met for Cell3	
antennaPortsCount-r11	an2		
mbsfn-SubframeConfigList-r11 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig {			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	'010000100001000010000000'	The CRS assistance information is	

		provided for Cell 3 in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation fourFrams= ‘01000010000100 0010000000’	
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.22.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfigList	Not present		Cell 1
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 2, Cell 3
radioframeAllocationPeriod	n4		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
fourFrames	‘010000100001000010000000’B		
}			
}			

Table 7.3.22.4.3-7: *SystemInformationBlockType3*: Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3

7.3.22.5 Test requirements

Table 7.3.22.5-1: Cell specific test parameters for E-UTRAN TDD in-sync radio link monitoring test (feICIC)

Parameter	Unit	Test 1														
		Cell1					Cell2					Cell3				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1					1				
$BW_{channel}$	MHz	10					10					10				
Correlation Matrix and Antenna Configuration		2x2 Low					2x2 Low					2x2 Low				
Special subframe configuration Note 1		6					6					6				
Uplink-downlink configuration Note 2		1					1					1				
PCFICH/PDCCH/ PHICH parameters		R.9 TDD					R.9 TDD					R.9 TDD				
OCNG Pattern defined in D.2.2 and D.2.6 (TDD)		OP.2 TDD					OP.6 TDD					OP.6 TDD				
ρ_A, ρ_B		-3					-3					-3				
PCFICH_RB	dB	1					Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.2-2									
PDCCH_RA	dB	-3														
PDCCH_RB	dB															
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PHICH_RA	dB															
PHICH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 3	dB															
OCNG_RB Note 3	dB															
SNR Note 8	dB	-0.6	-4.3	-14.6	-9.5	-0.6	3.8	3.8	4.2	4.2	3.8	1.8	1.8	2.2	2.2	1.8
N_{oc}	dBm/ 15 kHz	-98					-98					-98				
Propagation condition	Hz	ETU 30					ETU 30					ETU 30				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 of active cell is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.22.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth

7.3.23.1 Test purpose

Same test purpose as defined in clause 7.3.1.1.

7.3.23.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31.

7.3.23.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.1.3 with the following exceptions:

- Instead of A.7.3.1 → use A.7.3.23.

7.3.23.4 Test description

The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.23.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

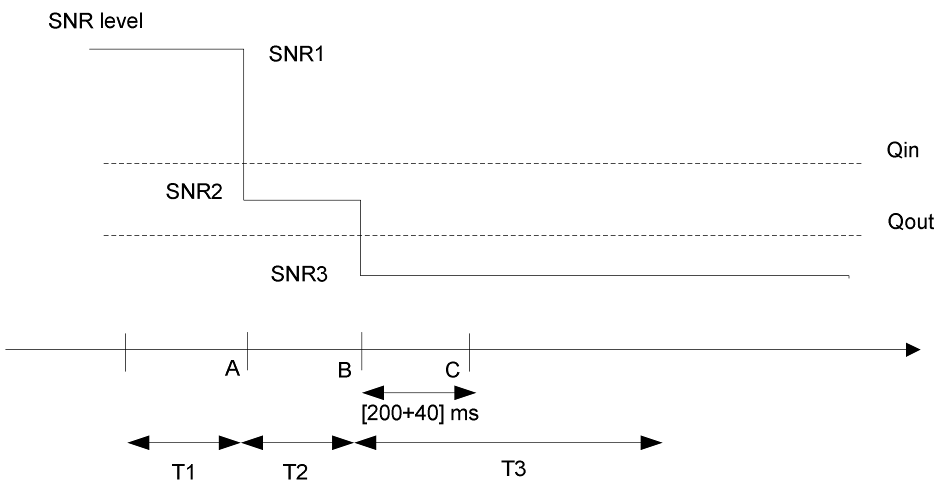

Figure 7.3.23.4-1: SNR variation for out-of-sync testing

7.3.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.23.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.23.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.23.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing for 5MHz bandwidth

Parameter		Unit	Value	Comment
			Test 4	
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.16 FDD	As specified in clause D.1.16.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5	
Out of sync transmission parameters (Note 1)	Number of Control OFDM Symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: See Table 7.3.1.4.1-1 for other general test parameters. Note 3: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.				

7.3.23.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.23.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.23.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.23.5-1. T3 starts.
5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.23.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.23.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-1

Table 7.3.23.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.23.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth requirements

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.23.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz bandwidth

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.23.5 Test requirement

Same test requirement as defined in clause 7.3.1.5 with the following exceptions:

Tables 7.3.1.4.1-1 and 7.3.23.5-1 define the primary level settings for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring for 5MHz bandwidth.

Table 7.3.23.5-1: Cell specific test parameters for E-UTRAN FDD for out-of-sync radio link monitoring test #4 under 5MHz Bandwidth

Parameter	Unit	Test 4		
		T1	**T2**	**T3**
$BW_{channel}$	MHz	5		
OCNG Pattern defined in A.3.2.1.16 (FDD)		OP.16 FDD		
SNR Note 6	dB	-1.4	-4.8	-13.1
Note 1: See Table 7.3.1.5-2 for other cell specific test parameters.				

7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth

7.3.24.1 Test purpose

Same test purpose as defined in clause 7.3.2.1.

7.3.24.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support Band 31.

7.3.24.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.1.3 with the following exceptions:

- Instead of A.7.3.2 → use A.7.3.24.

7.3.24.4 Test description

The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.24.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

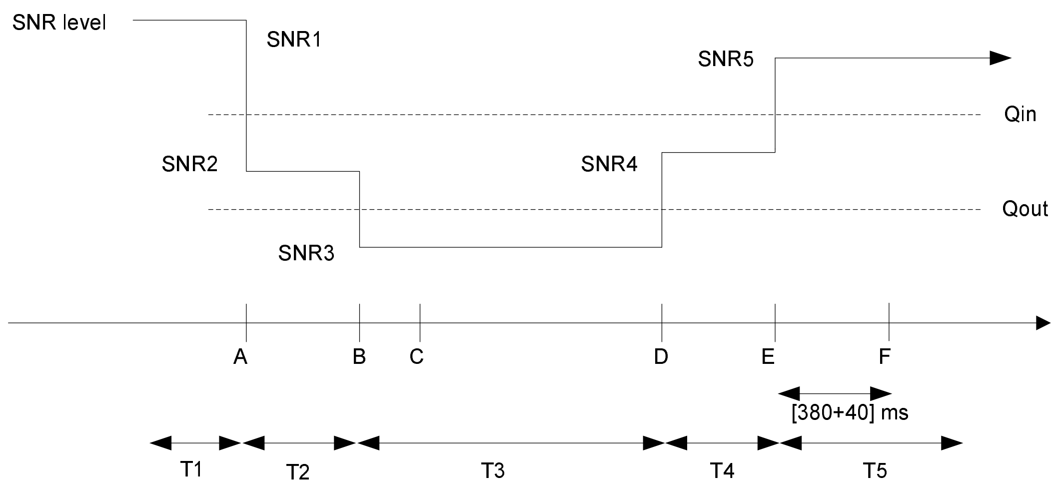

Figure 7.3.24.4-1: SNR variation for in-sync testing

7.3.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.
2. The general test parameter settings for the different subtest are set up according to Table 7.3.24.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.24.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.24.4.1-1: General test parameters for E-UTRAN FDD in-sync for 5MHz bandwidth testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.2.1. None of the PDCCH are intended for the UE under test
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5	
In sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	In sync threshold Qin and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
Out of sync transmission parameters (Note 1)	Number of Control OFDM symbols		3	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
Note 1: See Table 7.3.2.4.1-1 for other general test 2 parameters. Note 2: This test is performed according to the principle defined in TS 36.133 [4] section A.3.7.2.				

7.3.24.4.2 Test procedure

Same test procedure as defined in clause 7.3.2.4.2 with only Test 2 applied and with the following exceptions:

- Instead of Table 7.3.2.5-1 → use Table 7.3.24.5-1.

7.3.24.4.3 Message contents

Same message contents as defined in clause 7.3.2.4.3 with only Test 2 applied.

7.3.24.5 Test requirement

Same test requirement as defined in clause 7.3.2.5 with the following exceptions:

Tables 7.3.24.4.1-1 and 7.3.24.5-1 define the primary level settings for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test for 5MHz bandwidth.

Table 7.3.24.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test for 5MHz bandwidth

Parameter	Unit	T1	T2	T3	T4	T5
$BW_{channel}$	MHz	5				
OCNG Pattern defined in D.1.16 (FDD)		OP.16 FDD				
SNR	dB	-1.4	-4.8	-13.1	-8.2	-1.4
Propagation condition		ETU 70 Hz				
Note 1: See Table 7.3.2.5-1 for other general test 2 parameters.						

7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth

7.3.25.1 Test purpose

Same test purpose as defined in clause 7.3.6.1.

7.3.25.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31. Applicability requires support for FGI bit 5.

7.3.25.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 7.3.6.3 with the following exceptions:

- Instead of A.7.3.6 → use A.7.3.25.

7.3.25.4 Test description

Same test description as defined in clause 7.3.6.4.

7.3.25.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.
2. The general test parameter settings for the test are set up according to Table 7.3.25.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.25.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.25.4.1-1: General test parameters for E-UTRAN FDD in-sync in DRX for 5MHz bandwidth testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.12 FDD	As specified in clause A.2.1. None of the PDCCH are intended for the UE under test
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5	
In sync transmission parameters(Note 1)	Number of Control OFDM symbols		3	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-2 respectively.
Out of sync transmission parameters(Note 1)	Number of Control OFDM symbols		3	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.6.1 and Table 7.6.1-1 respectively.
Note 1: See Table 7.3.6.4.1-1 for other general test parameters. Note 2: This test is performed according to the principle defined in TS 36.133 [4] section A.3.7.2.				

7.3.25.4.2 Test procedure

Same test procedure as defined in clause 7.3.6.4.2 with the following exceptions:

- Instead of Table 7.3.6.5-1 → use Table 7.3.25.5-1.

7.3.25.4.3 Message contents

Same message contents as defined in clause 7.3.6.4.3.

7.3.25.5 Test requirement

Same test requirement as defined in clause 7.3.6.5 with the following exceptions:

Tables 7.3.25.4.1-1, 7.3.25.5-1, 7.3.6.5-2 and 7.3.6.5-3 define the primary level settings for E-UTRAN FDD (cell # 1) radio link monitoring test for In-sync in DRX for 5MHz bandwidth.

Table 7.3.25.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for In-sync radio link monitoring in DRX for 5MHz bandwidth test

Parameter	Unit	T1	T2	T3	T4	T5
$BW_{channel}$	MHz	5				
OCNG Pattern defined in D.1.16 (FDD)		OP.16 FDD				
SNR	dB	-1.7	-5.1	-12.8	-7.9	-1.7
Propagation condition		AWGN				
Note 1: See Table 7.3.6.5-1 for other general test parameters.						

7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

7.3.26.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.26.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE Category 0.

7.3.26.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.26.

7.3.26.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.26.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

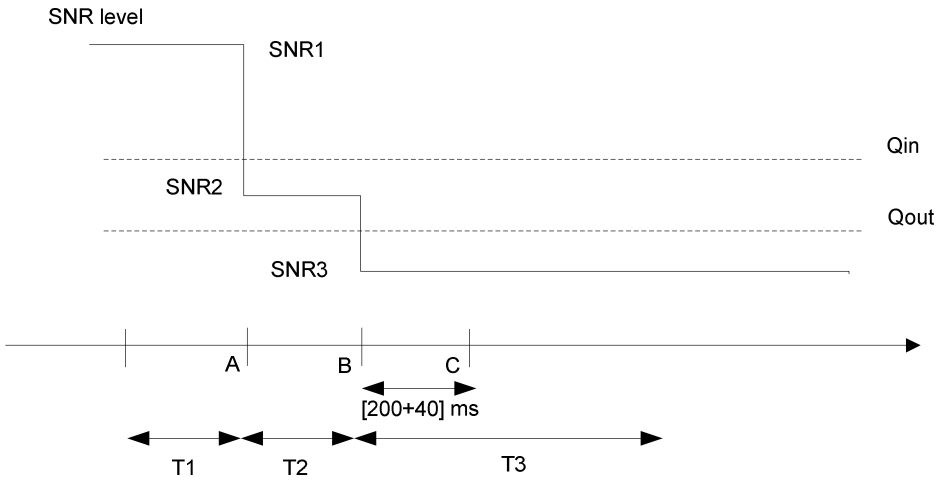

Figure 7.3.26.4-1: SNR variation for out-of-sync testing

7.3.26.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.26.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.26.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.26.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync test for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.26.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.26.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.26.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.26.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.26.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.26.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.26.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.26.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.26.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.26.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.26.5 Test requirement

Table 7.3.26.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.7 FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-1.2	-6.0	-13.8
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.26.4-1.				

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0

7.3.27.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.27.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0.

7.3.27.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.27.

7.3.27.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.27.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

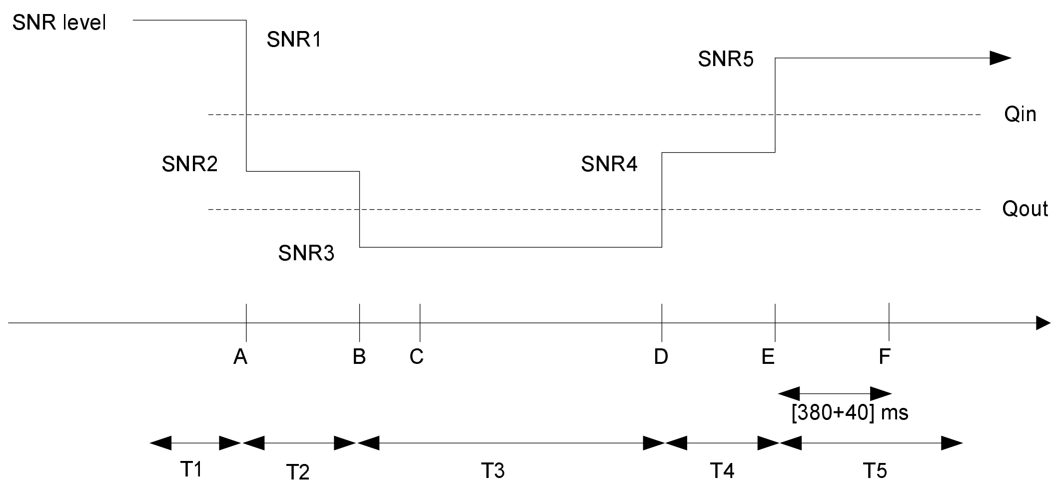

Figure 7.3.27.4-1: SNR variation for in-sync testing

7.3.27.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.27.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.27.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.27.4.1-1: General test parameters for E-UTRAN FD-FDD Radio Link Monitoring in-sync test for UE category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			*Enabled*	*Counters: N310 = 1; N311 = 1*
T310 timer		*ms*	*2000*	*T310 is enabled*
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	0.5	
T2		s	0.4	
T3		s	1.46	
T4		s	0.4	
T5		s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.27.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.27.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.27.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.27.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.27.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.27.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.27.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.27.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.27.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.27.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.27.5 Test requirement

Table 7.3.27.5-1: Cell specific test parameters for E-UTRAN FD-FDD in-sync Radio Link Monitoring Test for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-1.2	-6.0	-13.8	-8.0	-1.2
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.27.1-1.						

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

7.3.28.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.28.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.28.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_Cat0}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_Cat0}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.28.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for FD-FDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ and $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.28.

7.3.28.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.28.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

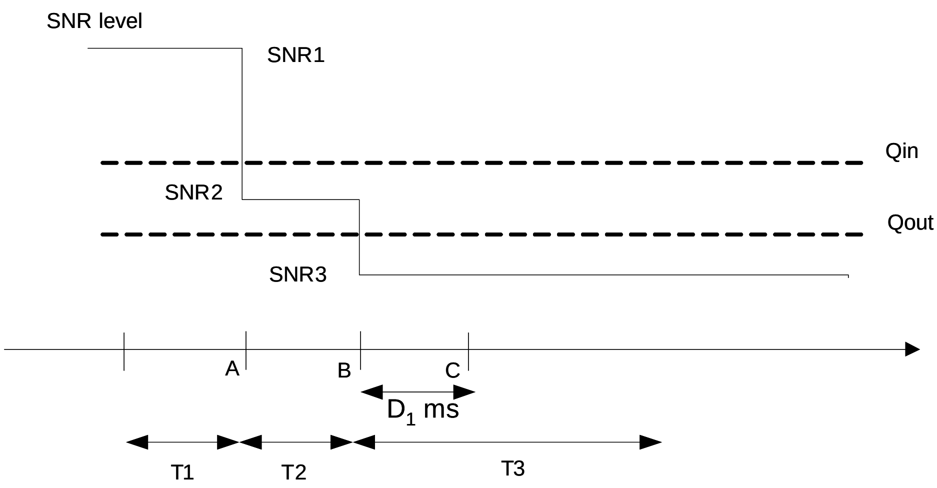

Figure 7.3.28.4-1: SNR variation for out-of-sync testing in DRX

7.3.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.28.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.28.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.28.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync test in DRX for category 0

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Value</th><th>Comment</th></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1</td><td>Cell 1 is on E-UTRA RF channel number 1</td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>One E-UTRA FDD carrier frequency is used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth (BWchannel)</td><td>MHz</td><td>10</td><td></td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td></td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>As defined in clause 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td rowspan="5">Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>4</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>1</td></tr>
<tr><td colspan="2">DRX cycle</td><td>ms</td><td>1280</td><td>See Table 7.3.28.5-2</td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>0</td><td>T310 is disabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213.</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>2</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>32</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>12.8</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>13</td><td></td></tr>
<tr><td colspan="5">Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.28.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.28.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.28.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.28.5-1. T3 starts.

5. If the SS:

   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3)

until T3 expires,
the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.28.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.28.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.28.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.28.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.28.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.28.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.28.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.28.5 Test requirement

Table 7.3.28.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-5.5	-9.4	-14.6
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.28.4-1.				

Table 7.3.28.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.28.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

7.3.29.1 Test purpose

The purpose of this test is to verify that the FD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.29.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.29.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_Cat0}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_Cat0}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within

$T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.29.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for FD-FDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ and $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.29.

7.3.29.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.29.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

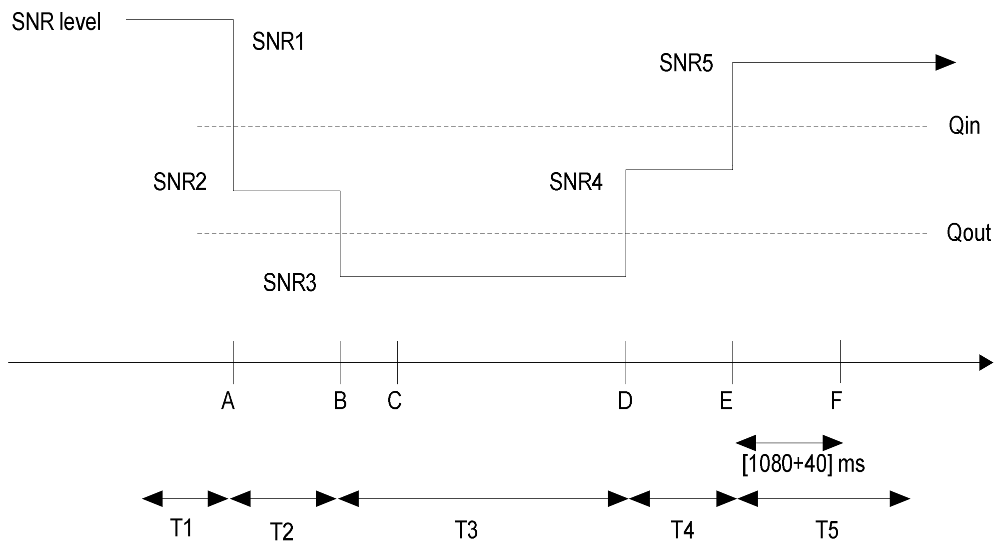

Figure 7.3.29.4-1: SNR variation for in-sync testing in DRX

7.3.29.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.29.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.29.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.29.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE		1	
	Ratio of PCFICH to RS EPRE		1	

Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table 7.3.29.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.29.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.29.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.29.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.29.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.29.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.29.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.29.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.29.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.29.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.29.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.29.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.29.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.29.5 Test requirement

Table 7.3.29.5-1: Cell specific test parameters for E-UTRAN FD-FDD in-sync Radio Link Monitoring Test in DRX for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	-5.5	-9.4	-14.6	-10.7	-5.5
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.29.4-1.

Table 7.3.29.5-2: DRX-Configuration for E-UTRAN FD-FDD in-sync radio link monitoring tests in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.29.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD in-sync radio link monitoring test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

7.3.30.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.30.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE Category 0.

7.3.30.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When no DRX is used: The HD-FDD category 0 UE shall meet all applicable requirements specified in TS.36.133 [4] clause 7.11.2.1 under the following conditions

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_Cat0} and Q_{out_Cat0} evaluation periods.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within

200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.30.

7.3.30.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.30.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 10 ms.

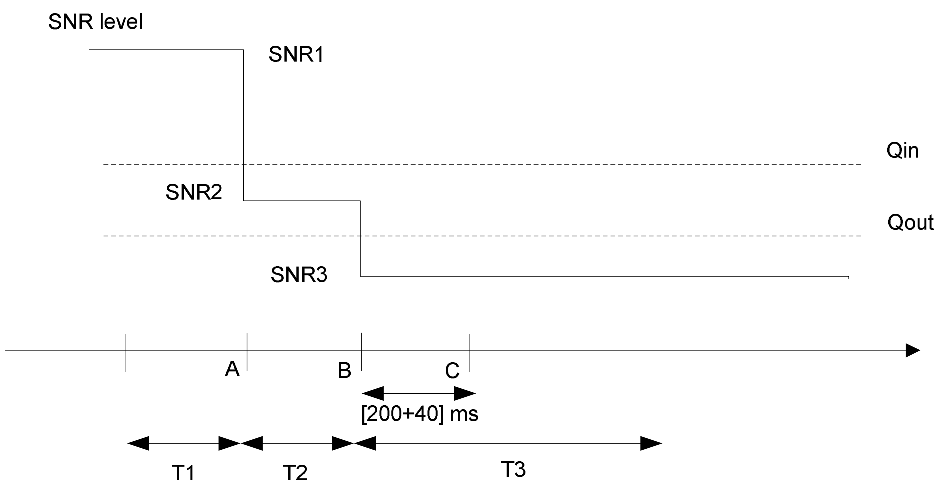

Figure 7.3.30.4-1: SNR variation for out-of-sync testing

7.3.30.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.30.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.30.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.30.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync test for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	10	Minimum CQI reporting periodicity
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.30.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [TBD] ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.30.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.30.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.30.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.30.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.30.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.30.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	7	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.30.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
}			

Table 7.3.30.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.30.5 Test requirement

Table 7.3.30.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in A.2.3		R.4 HD-FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-0.3	-5.1	-12.9
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.30.4-1.				

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.

- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0

7.3.31.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.31.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0.

7.3.31.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When no DRX is used: The HD-FDD category 0 UE shall meet all applicable requirements specified in TS.36.133 [4] clause 7.11.2.1 under the following conditions:

- at least 1 DL subframe per radio frame of PCell is available at the UE during Q_{in_Cat0} and Q_{out_Cat0} evaluation periods.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.31.

7.3.31.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.31.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 10 ms.

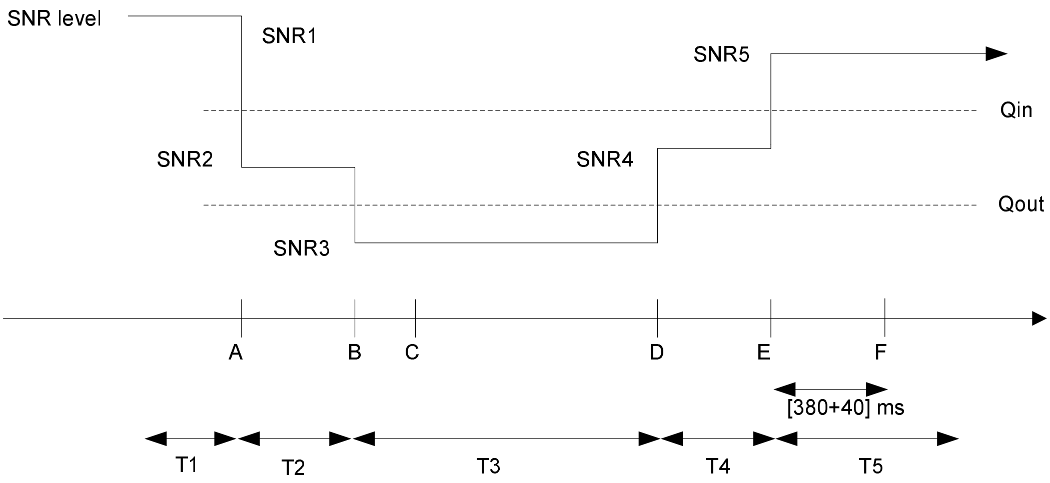

Figure 7.3.31.4-1: SNR variation for in-sync testing

7.3.31.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.31.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.31.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.31.4.1-1: General test parameters for E-UTRAN HD-FDD Radio Link Monitoring in-sync test for UE category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			*Enabled*	*Counters: N310 = 1; N311 = 1*
T310 timer		*ms*	*2000*	*T310 is enabled*
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	10	Minimum CQI reporting periodicity
T1		s	0.5	
T2		s	0.4	
T3		s	1.46	
T4		s	0.4	
T5		s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.31.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [TBD] ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.31.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.31.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.31.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.31.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.31.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.31.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.31.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	7	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.31.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.31.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.31.5 Test requirement

Table 7.3.31.5-1: Cell specific test parameters for E-UTRAN HD-FDD in-sync Radio Link Monitoring Test for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5

E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.3		R.4 HD-FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA[Note 1]	dB					
OCNG_RB[Note 1]	dB					
N_{oc}	dBm/15 kHz	-98				
SNR [Note 6]	dB	-0.3	-5.1	-12.9	-7.1	-0.3
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.27.1-1.						

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

7.3.32.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.32.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.32.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for HD-FDD category 0 UEs, the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_Cat0}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_Cat0}$) specified in Table 7.3.32.3-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.32.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX}$ and $T_{Evaluate\_}Q_{in\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0.16	Note (20)
0.16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.32.

7.3.32.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.32.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

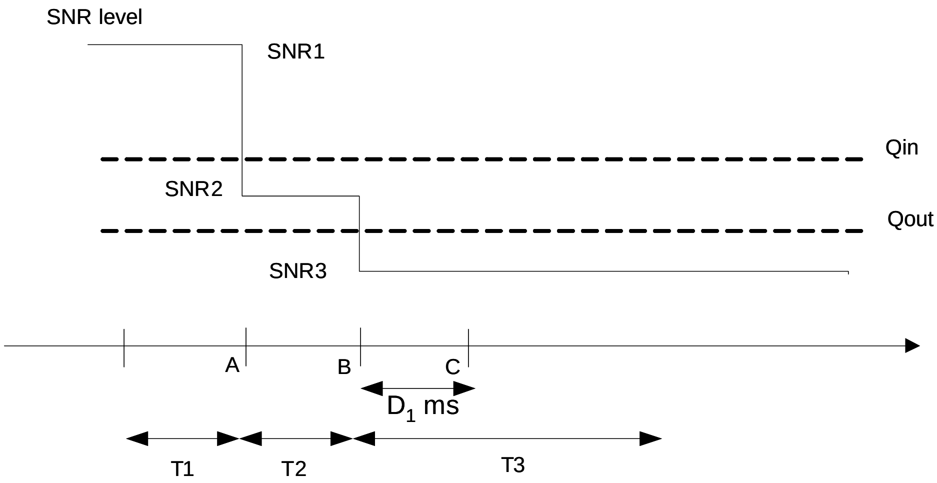

Figure 7.3.32.4-1: SNR variation for out-of-sync testing in DRX

7.3.32.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.32.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.32.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.32.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	1280	See Table 7.3.32.4-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	5	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.32.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.32.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.32.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.32.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.32.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.32.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.32.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	2	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.32.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.32.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.32.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.32.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.32.5 Test requirement

Table 7.3.32.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.3		R.4 HD-FDD		
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-4.8	-8.9	-14.1
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.28.4-1.				

Table 7.3.32.5-2: DRX-Configuration for E-UTRAN HD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	Psf5	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.32.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

7.3.33.1 Test purpose

The purpose of this test is to verify that the HD-FDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.33.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.33.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for HD-FDD category 0 UEs, the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_Cat0}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_Cat0}$) specified in Table 7.3.33.3-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within

$T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.33.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX}$ and $T_{Evaluate\_}Q_{in\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0.16	Note (20)
0.16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2, 7.11.3 and A.7.3.33.

7.3.33.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.29.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

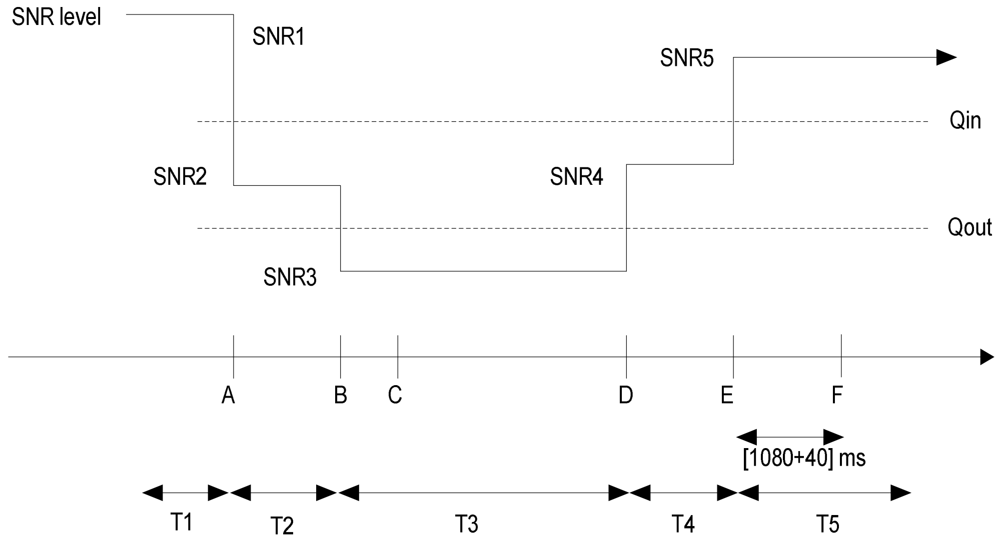

Figure 7.3.33.1-1: SNR variation for in-sync testing in DRX

7.3.33.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.33.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.33.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.33.4.1-1: General test parameters for E-UTRAN HD-FDD in-sync test in DRX for category 0

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Value</th><th>Comment</th></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1</td><td>Cell 1 is on E-UTRA RF channel number 1</td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>One E-UTRA FDD carrier frequency is used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth ($BW_{channel}$)</td><td>MHz</td><td>10</td><td></td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td></td></tr>
<tr><td rowspan="6">In sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1C</td><td>As defined in clause 5.3.3.1.4 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td rowspan="5">In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>4</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td></td><td>1</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td></td><td>1</td></tr>
</table>

Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table 7.3.29.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	5	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.33.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 5 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.33.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.33.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.33.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.33.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.33.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.33.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.33.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	2	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.33.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	Psf5		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.33.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.33.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.33.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.33.5 Test requirement

Table 7.3.33.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for In-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1				
		T1	**T2**	**T3**	**T4**	**T5**
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
PCFICH/PDCCH/PHICH parameters specified in clause A.2.3		R.4 HD-FDD				
OCNG Pattern defined in D.1.2 (FDD)		OP.2 FDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-4.8	-8.9	-14.1	-10.0	-4.8
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.33.1-1.

Table 7.3.33.5-2: DRX-Configuration for E-UTRAN HD-FDD in-sync radio link monitoring tests in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf5	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.33.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync radio link monitoring tests in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

7.3.34.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.34.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE Category 0.

7.3.34.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.34.

7.3.34.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.26.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync state. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

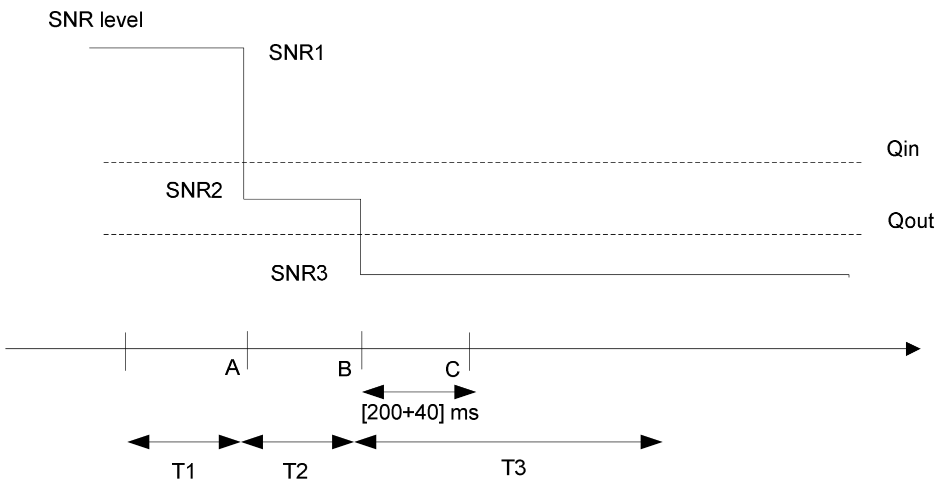

Figure 7.3.34.4-1: SNR variation for out-of-sync testing

7.3.34.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.34.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.34.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.34.4.1-1: General test parameters for E-UTRAN TDD out-of-sync test for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] in section 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	1	
T2		s	0.4	
T3		s	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.34.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.34.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.34.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.34.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (240 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.34.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.34.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.34.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.34.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.34.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.34.5 Test requirement

Table 7.3.34.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.7 TDD		
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-0.7	-5.0	-12.8
Propagation condition		ETU 70Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.34.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0

7.3.35.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.35.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0.

7.3.35.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 200ms Q_{out_Cat0} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 100 ms period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 100 ms Q_{in_Cat0} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.35.

7.3.35.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.35.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

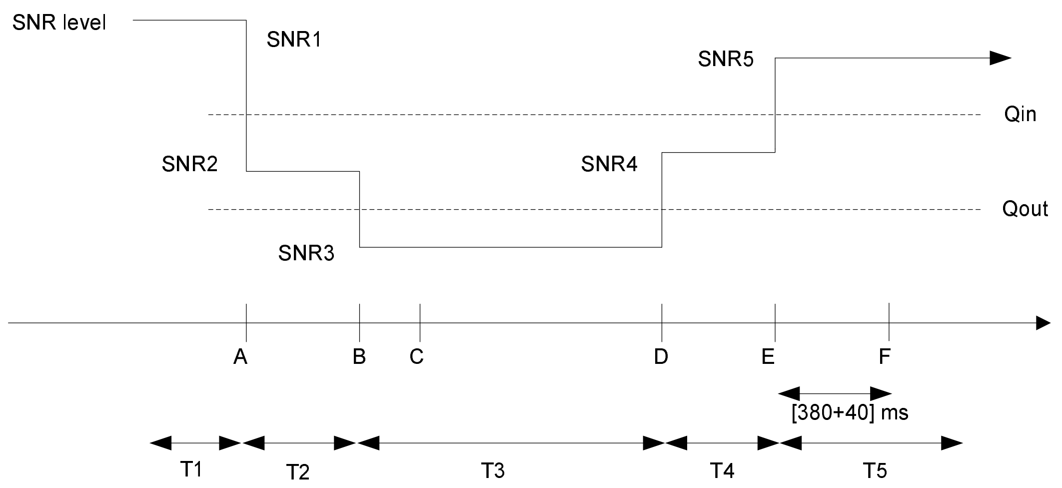

Figure 7.3.35.4-1: SNR variation for in-sync testing

7.3.35.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.35.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.35.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.35.4.1-1: General test parameters for E-UTRAN TDD Radio Link Monitoring in-sync test for UE category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	0.5	
T2		s	0.4	
T3		s	1.46	
T4		s	0.4	
T5		s	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.35.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.35.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.35.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.35.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.35.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.35.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (420 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.35.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.35.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.35.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.35.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.35.5 Test requirement

Table 7.3.35.5-1: Cell specific test parameters for E-UTRAN TDD in-sync Radio Link Monitoring Test for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 TDD				
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	-0.7	-5.0	-12.8	-7.5	-0.7
Propagation condition		ETU 70Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.35.4-1.						

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0

7.3.36.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.11.

7.3.36.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.36.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_Cat0}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_Cat0}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.36.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for TDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ and $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.36.

7.3.36.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.36.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

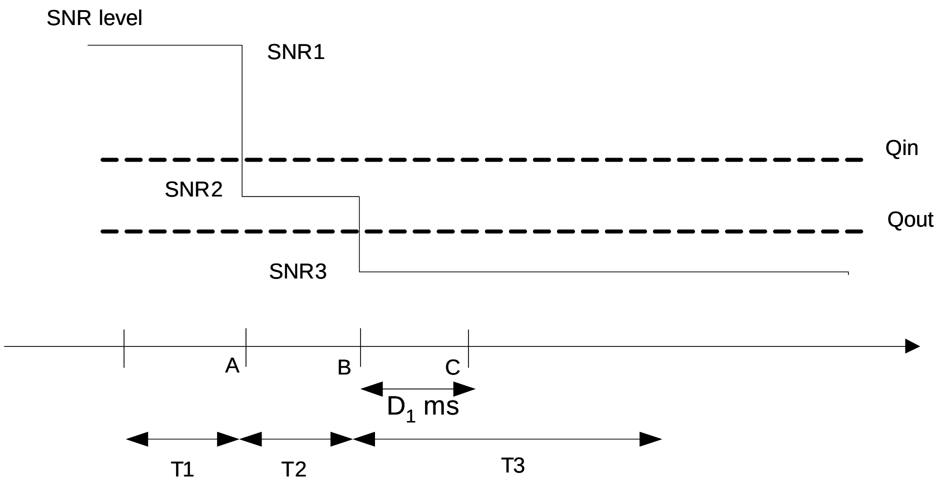

Figure 7.3.36.4-1: SNR variation for out-of-sync testing in DRX

7.3.36.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.28.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.28.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.36.4.1-1: General test parameters for E-UTRAN TDD out-of-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Qout and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	1280	See Table 7.3.28.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.36.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 7.3.36.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.36.5-1. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.36.5-1. T3 starts.

5. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (6500 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.36.5-1.

7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.36.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.36.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.36.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.36.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.36.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.36.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.36.5 Test requirement

Table 7.3.36.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category 0

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
PCFICH/PDCCH/PHICH parameters defined in clause A.2.1		R.7 TDD		
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD		
ρ_A, ρ_B		-3		
PCFICH_RB	dB	1		
PDCCH_RA	dB	4		
PDCCH_RB	dB	4		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	-5.0	-9.0	-14.2
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.36.4-1.

Table 7.3.36.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.36.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal.
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0

7.3.37.1 Test purpose

The purpose of this test is to verify that the TDD category 0 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 [4] section 7.11.

7.3.37.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

7.3.37.3 Minimum conformance requirements

The UE category 0 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for FD-FDD and TDD category 0 UEs, the Q_{out_Cat0} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_Cat0}$) and the Q_{in_Cat0} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_Cat0}$) is specified in TS36.133 [4] Table 7.11.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] period becomes worse than the threshold Q_{out_Cat0}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_Cat0}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] period becomes better than the threshold Q_{in_Cat0}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_Cat0}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.37.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for TDD and TDD UE category 0

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX\_Cat0}}$ and $T_{Evaluate\_Q_{in\_DRX\_Cat0}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.11.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.11.1, 7.11.2 and A.7.3.37.

7.3.37.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.37.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

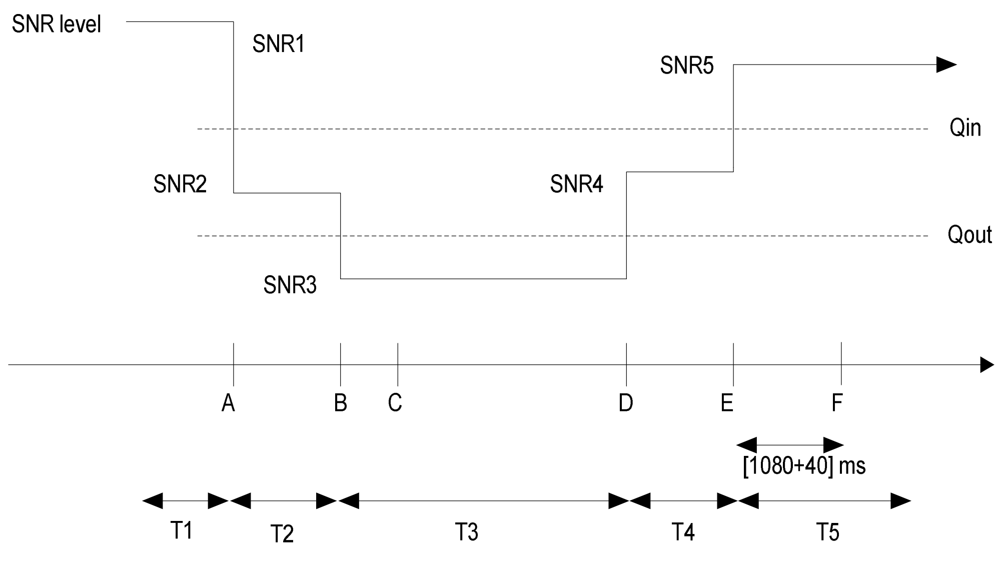

Figure 7.3.37.4-1: SNR variation for in-sync testing in DRX

7.3.37.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.37.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.37.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.37.4.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX for category 0

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE		1	
	Ratio of PCFICH to RS EPRE		1	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 [4] clause 7.11.1 and Table 7.11.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		-3	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle		ms	40	See Table 7.3.29.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.37.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.37.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.37.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.37.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.37.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.37.5-1. T5 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.37.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.37.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.37.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.37.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for UE category 0

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.37.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.37.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.37.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for category 0 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

7.3.37.5 Test requirement

Table 7.3.37.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category 0

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
PCFICH/PDCCH/PHICH parameters defined in section A.2.2		R.7 TDD				
OCNG Pattern defined in D.1.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		-3				
PCFICH_RB	dB	1				
PDCCH_RA	dB	1				
PDCCH_RB	dB	1				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note2	dB					
OCNG_RB Note2	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 7	dB	-5.0	-9.0	-14.2	-10.2	-5.0
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 7: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.37.4-1.						

Table 7.3.37.5-2: DRX-Configuration for E-UTRAN TDD in-sync test in DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf2	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf40	
shortDRX	disable	

Table 7.3.37.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD in-sync test in DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

7.3.38.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.38.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity.

7.3.38.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.38.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.38.

7.3.38.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.38.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

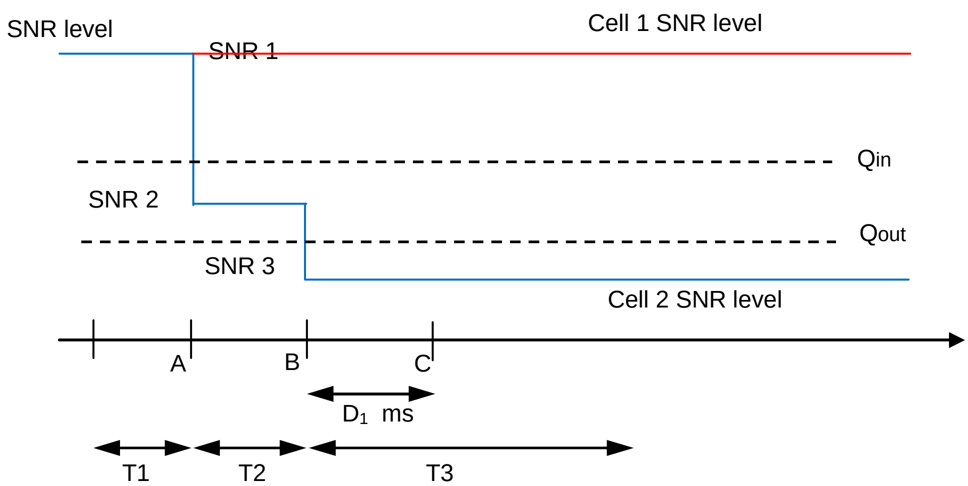

Figure 7.3.38.4-1 SNR variation for out-of-sync testing in DRX

7.3.38.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.38.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.38.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.38.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.38.4.1-1: General test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Value</th><th>Comment</th></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1
Cell 2</td><td>Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2</td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td></td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1, 2</td><td>Two E-UTRA FDD carrier frequencies are used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth (BWchannel)</td><td>MHz</td><td>5, 10, 20</td><td></td></tr>
<tr><td colspan="2">Correlation Matrix and Antenna Configuration</td><td></td><td>2x2 Low</td><td>Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>As defined in clause 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>5MHz: 3
10MHz: 2
20MHz: 2</td><td rowspan="5">Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td></tr>
<tr><td>ρA, ρB</td><td></td><td>-3</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>1</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>1</td></tr>
<tr><td colspan="2">DRX cycle on cell 1</td><td>ms</td><td>640</td><td>See Table 7.3.38.5-2</td></tr>
<tr><td colspan="2">DRX cycle on cell 2</td><td>ms</td><td>40</td><td>See Table 7.3.38.5-2</td></tr>
<tr><td colspan="2">Timing offset between cell 1 and cell 2</td><td>μs</td><td>33</td><td>For synchronous dual connectivity</td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1; N313 = 1; N314 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>0</td><td>T310 is disabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">T313 timer</td><td>ms</td><td>0</td><td>T313 is disabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213.</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>2</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>4</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>1.6</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>1.8</td><td></td></tr>
<tr><td colspan="5">Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.38.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.38.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.38.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.38.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.38.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.38.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.38.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.38.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.38.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.38.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.38.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.38.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.38.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.38.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.38.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.38.5 Test requirement

Table 7.3.38.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6 (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-4.8	-13.1
SNR Note 6 (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.3	-13.1
SNR Note 6 (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-22.0	-5.9	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1	μs	-			33		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.38.4-1.

Table 7.3.38.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.38.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

7.3.39.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX in asynchronous dual connectivity is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.39.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports asynchronous Dual Connectivity.

7.3.39.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.39.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.39.

7.3.39.4 Test description

There are two cells, cell 1 is PCell in MCG and cell 2 is PSCell in SCG, in the test. Before the test starts the UE is connected to cell 1 on radio channel 1 and to cell 2 on radio channel 2. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. The downlink SNR in cell 1 keeps constant in the test. Figure 7.3.39.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

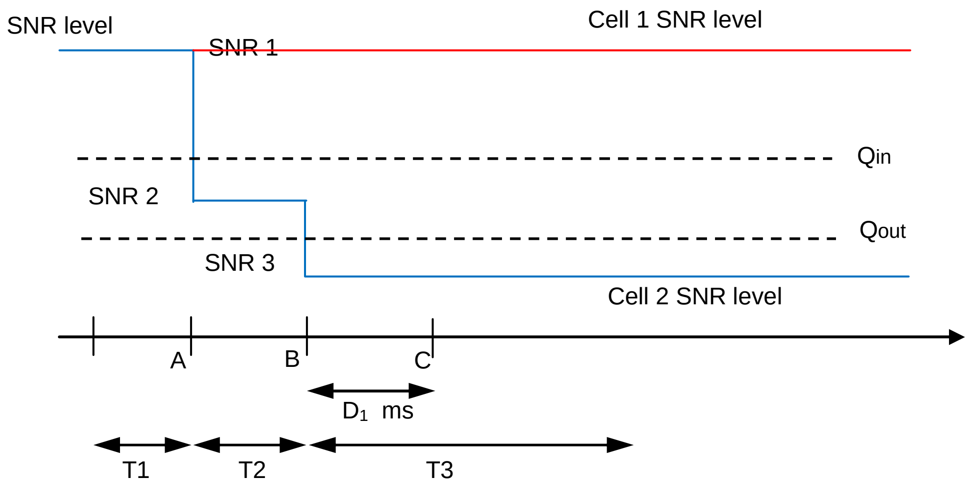

Figure 7.3.39.4-1: SNR variation for out-of-sync testing in DRX

7.3.39.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.39.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.39.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.39.4.3

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.39.4.1-1: General test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 (PCell) is on E-UTRA RF channel number 1 and cell 2 (PSCell) is on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	Two E-UTRA FDD carrier frequencies are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.39.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.39.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.39.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF_DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.39.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.39.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.39.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.39.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.39.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.39.4.3 Message contents

Same message contents as defined in clause 7.3.38.4.3.

7.3.39.5 Test requirement

Table 7.3.39.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 6 (5MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-4.8	-13.1
SNR Note 6 (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.3	-13.1
SNR Note 6 (20MHz bandwidth)	dB	-2.0	-2.0	-2.0	-2.0	-5.9	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Receive time offset to cell1 Note 7	μs	-			500		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.39.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.39.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.39.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink on cell 1 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

During the period from time point A to time point B the UE shall transmit uplink signal on cell 2 at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal on cell 2 no later than time point C (duration D1 = 900 ms after the start of time duration T3).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

7.3.40.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.40.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Dual Connectivity.

7.3.40.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.40.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.40.

7.3.40.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.40.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

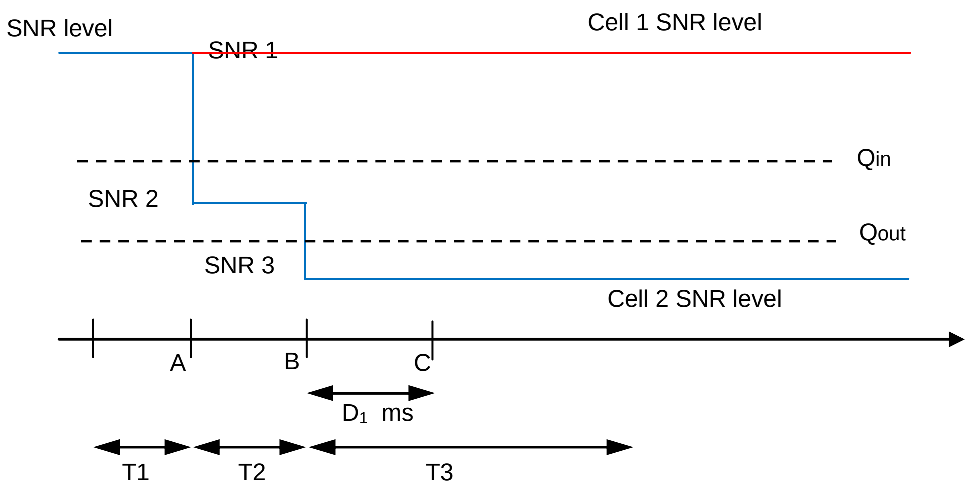

Figure 7.3.40.4-1 SNR variation for out-of-sync testing in DRX

7.3.40.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.40.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.40.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.40.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.40.4.1-1: General test parameters for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	Two E-UTRA TDD carrier frequencies are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.40.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.40.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.40.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF_DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.40.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.40.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.40.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.40.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   The number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.40.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.40.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.40.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.40.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.40.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.40.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.40.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.40.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.38.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 7.3.40.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.40.5 Test requirement

Table 7.3.40.5-1: Cell specific test parameters for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD			5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD		
OCNG Pattern		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note3]	dB						
OCNG_RB[Note3]	dB						
SNR [Note 8] (5MHz bandwidth)	dB	-0.7	-0.7	-0.7	-0.7	-4.3	-12.8
SNR [Note 8] (10MHz bandwidth)	dB	-1.4	-1.4	-1.4	-1.4	-5.0	-12.8
SNR [Note 8] (20MHz bandwidth)	dB	-2.1	-2.1	-2.1	-2.1	-5.7	-13.5
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1	μs	-			33		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.40.41-1.

Table 7.3.40.5-2: DRX-Configuration for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.40.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.41.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.41.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports Dual Connectivity.

7.3.41.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.41.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.41.

7.3.41.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.38.4-1 shows the variation of the downlink SNR in the PSCell to emulate In-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration for PCell and PSCell is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

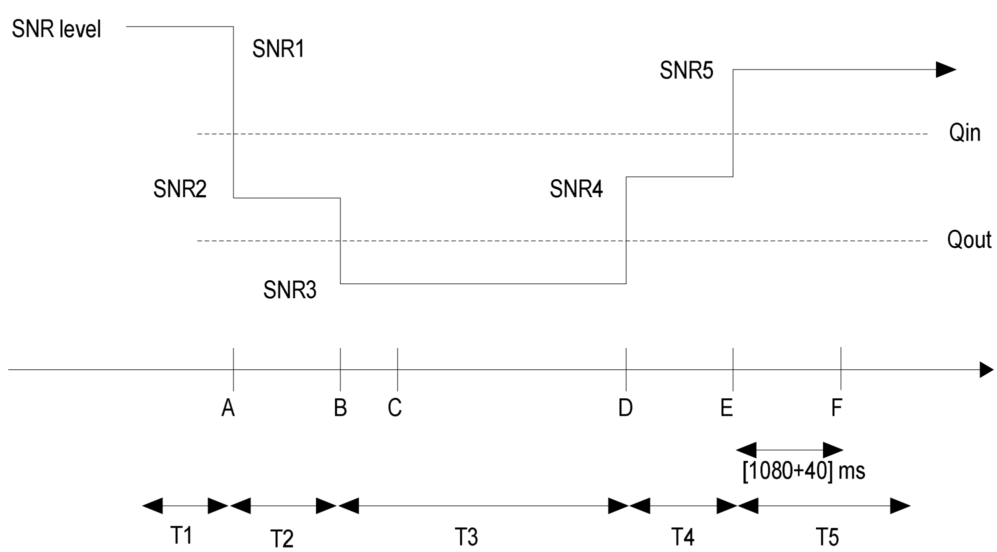

Figure 7.3.41.4-1: SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.41.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.41.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.41.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.41.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.41.4.1-1: General test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two E-UTRA FDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table 7.3.41.5-2
DRX cycle on Cell 2		ms	40	See Table A.7.3.41.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5				

7.3.41.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3C-RF, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.41.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.41.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.41.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.41.5-1. T3 starts.

7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.41.5-1. T4 starts.

8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.41.5-1. T5 starts.

9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.41.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.41.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.41.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.41.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.41.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.41.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.41.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.41.4.3-7: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.41.5 Test requirement

Table 7.3.41.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter	Unit	Cell 1(PCell)	Cell 2 (PSCell)				
		T1 ~ T5	T1	T2	T3	T4	T5

E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
PCFICH/PDCCH/PHICH parameters defined in A.2.1			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Pattern defined in D.1 (FDD)			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA Note1		dB						
OCNG_RB Note1		dB						
SNR Note 6	5MHz $BW_{channel}$	dB	-1.7	-1.7	-5.1	-12.8	-7.9	-1.7
	10MHz $BW_{channel}$		-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
	20MHz $BW_{channel}$		-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 Note 7		μs	-	33				

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR of cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.41.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.41.5-2: DRX-Configuration for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331[5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table 7.3.41.5-3: TimeAlignmentTimer Configuration for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value	
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.42.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in asynchronous dual connectivity. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in clause 7.6.

7.3.42.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports asynchronous Dual Connectivity.

7.3.42.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Qout\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_Qin\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Qin\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Qin\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.41.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.42.

7.3.42.4 Test description

There are two cells in the test. Cell 1 is PCell in MCG and cell 2 is PSCell in SCG. Before the test starts the UE is connected to cell 1 on radio channel 1 and to cell 2 on radio channel 2. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. The downlink SNR in cell 1 keeps constant in the test. Figure 7.3.42.4-1 shows the variation of the downlink SNR in cell 2 to emulate In-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2 in asynchronous dual connectivity. For both cell 1 and cell 2, the UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

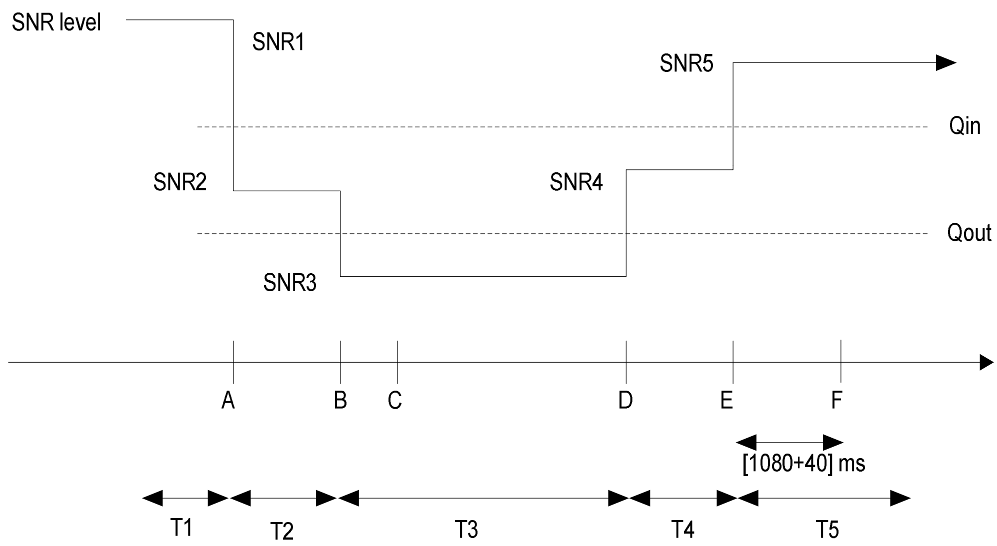

Figure 7.3.42.4-1: Cell 2 SNR variation for in-sync testing in DRX

7.3.42.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.42.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.42.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.42.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.42.4.1-1: General test parameters for E-UTRAN FDD-FDD Radio Link Monitoring in-sync test in DRX dual connectivity

Parameter		Unit	Value	Comment
Active cells			Cell 1 and cell 2	Cell 1 (PCell) is on E-UTRA RF channel number 1 and cell 2 (PSCell) is on E-UTRA RF channel number 2
CP length			Normal	
Antenna Configuration			1x2	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	

DRX cycle in cell 1	ms	640	See Table 7.3.42.5-2
DRX cycle in cell 2	ms	40	See Table 7.3.42.5-2
Layer 3 filtering		Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer	ms	2000	T310 is enabled
T311 timer	ms	1000	T311 is enabled
T313 timer	ms	2000	T313 is enabled
Periodic CQI reporting mode		PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity	ms	2	Minimum CQI reporting periodicity
T1	s	4	
T2	s	1.6	
T3	s	1.46	
T4	s	0.4	
T5	s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: The parameters in the table apply to both cell 1 and cell 2 unless defined otherwise. Note 3: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.			

7.3.42.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.42.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.42.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.42.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.42.5-1. T3 starts.

7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.42.5-1. T4 starts.

8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.42.5-1. T5 starts.

9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.42.4.3 Message contents

Same message contents as defined in clause 7.3.41.4.3.

7.3.42.5 Test requirement

Table 7.3.42.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in asynchronous dual connectivity

Parameter		Unit	Cell 1 (PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	5, 10, 20	5, 10, 20				
PCFICH/PDCCH/PHICH parameters. None of the PDCCH are intended for the UE under test.			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Pattern			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA Note1		dB						
OCNG_RB Note1		dB						
SNR Note 6	5MHz $BW_{channel}$	dB	-1.7	-1.7	-5.1	-12.8	-7.9	-1.7
	10MHz $BW_{channel}$	dB	-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
	20MHz $BW_{channel}$	dB	-4.1	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN					
Receive time offset to cell1 Note 7		μs	-	500				

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR of cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.42.4-1.
Note 7: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells..

Table 7.3.42.1-3: DRX-Configuration for E-UTRAN FDD In-sync tests

Field	Cell 1	Cell 2	Comment
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table 7.3.42.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD In-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5].
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.43.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in clause 7.6.

7.3.43.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports Dual Connectivity.

7.3.43.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.41.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.43.

7.3.43.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.43.4-1 shows the variation of the downlink SNR in the PSCell to emulate In-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration for PCell and PSCell is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

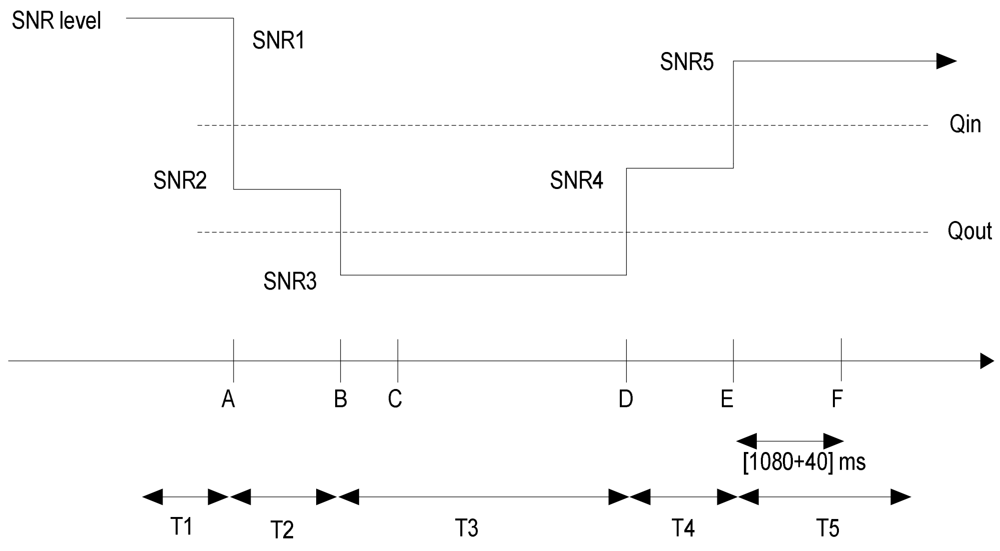

Figure 7.3.43.4-1: SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.43.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.43.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.43.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.43.4.3.

5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.43.4.1-1: General test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two E-UTRA TDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA RF channel number 1, and cell 2 is PSCell on E-UTRA RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table A.7.3.43.1-3
DRX cycle on Cell 2		ms	40	See Table A.7.3.43.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.				

7.3.43.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.43.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.
4. Set the parameters according to T1 in Table 7.3.43.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.43.5-1. T2 starts.
6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.43.5-1. T3 starts.
7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.43.5-1. T4 starts.
8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.43.5-1. T5 starts.
9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.43.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.43.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.43.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.43.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.43.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.43.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.43.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.43.4.3-7: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in synchronous DC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.43.5 Test requirement

Table 7.3.43.5-1: Cell specific test parameters for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Parameter	Unit	Cell 1(PCell)	Cell 2 (PSCell)				
		T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1	2				
$BW_{channel}$	MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
Special subframe configuration[Note1]		6	6				
Uplink-downlink configuration[Note2]		1	1				
PCFICH/PDCCH/PHICH parameters defined in A.2.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				
OCNG Pattern defined in D.2 (TDD)		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				
ρ_A, ρ_B		0	0				
PCFICH_RB	dB	4	4				
PDCCH_RA	dB	0	0				
PDCCH_RB	dB	0	0				
PBCH_RA	dB	0	0				
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR [Note 6] 5MHz $BW_{channel}$	dB	-4.5	-4.5	-8.5	-13.7	-9.7	-4.5
SNR [Note 6] 10MHz $BW_{channel}$	dB	-4.5	-4.5	-8.5	-13.7	-9.7	-4.5
SNR [Note 6] 20MHz $BW_{channel}$	dB	-4.5	-4.5	-8.5	-13.7	-9.7	-4.5
N_{oc}	dBm/15 kHz	-98					
Propagation condition		AWGN	AWGN				
Correlation Matrix and Antenna Configuration		1x2	1x2				
Receive time offset to cell1 [Note 9]	µs	-	33				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.43.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.43.5-2: DRX-Configuration for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331[5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf640	sf40	
shortDRX	disable	disable	

Table 7.3.43.5-3: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.44 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.44.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.44.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.44.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.44.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.44.

7.3.44.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.44.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

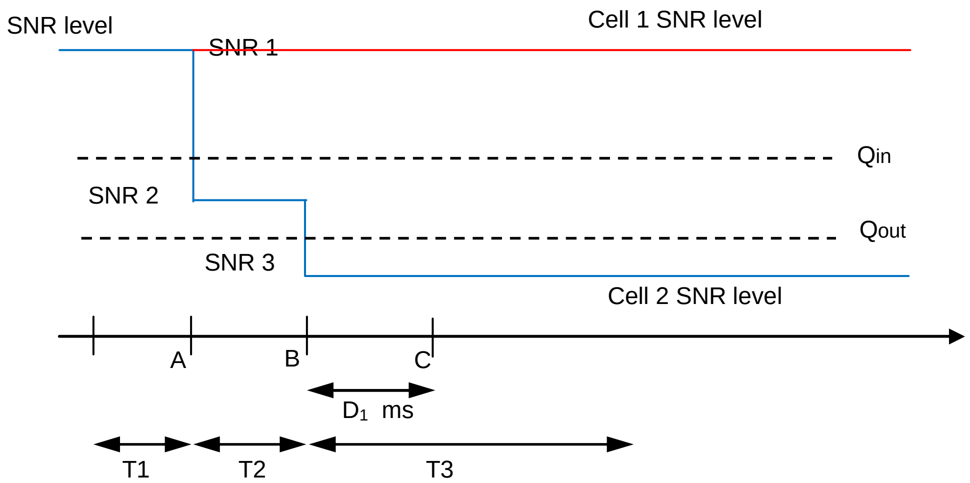

Figure 7.3.44.4-1 SNR variation for out-of-sync testing in DRX

7.3.44.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.44.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.44.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.44.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.44.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA FDD RF channel number 1, and cell 2 is PSCell on E-UTRA TDD RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	One E-UTRA FDD carrier frequency and one E-UTRA TDD carrier frequency are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.44.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.44.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.44.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.44.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.44.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.44.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.44.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,

   the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.44.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.44.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.44.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.44.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD, for Cell 1 (FDD)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.44.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.44.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.44.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.44.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.44.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.44.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.44.5 Test requirement

Table 7.3.44.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note7]		-			6		
Uplink-downlink configuration[Note8]		-			1		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD			5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD		
OCNG Pattern		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR [Note 6] (5MHz bandwidth)	dB	-2.3+TT	-2.3+TT	-2.3+TT	-1.6+TT	-5.2+TT	-11.9+TT
SNR [Note 6] (10MHz bandwidth)	dB	-2.3+TT	-2.3+TT	-2.3+TT	-2.3+TT	-5.9+TT	-11.9+TT
SNR [Note 6] (20MHz bandwidth)	dB	-2.9+TT	-2.9+TT	-2.9+TT	-3.0+TT	-6.6+TT	-12.6+TT
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1 [Note 9]	μs	-			33		
CQI reporting periodicity	ms	2			1		

Note 1: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, and T3 are denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.38.1-1.
Note 7: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 8: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.44.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.44.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.45 E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.45.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.45.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.45.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_Qout\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_Qin\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_Qin\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_Qin\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.45.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.45.

7.3.45.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of three successive time periods with time duration of T1, T2 and T3 respectively. Figure 7.3.45.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

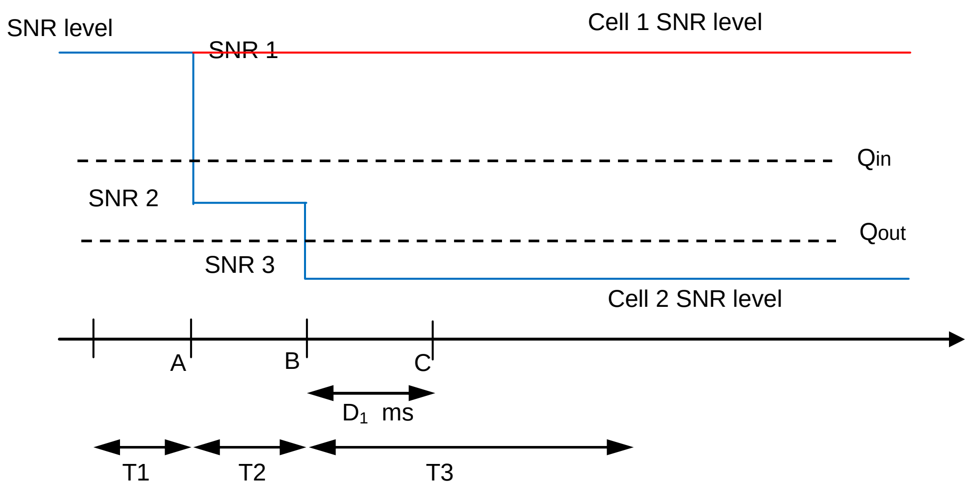

Figure 7.3.45.4-1 SNR variation for out-of-sync testing in DRX

7.3.45.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.45.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.40 (without connection the AWGN sources) as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.45.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.45.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.45.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Value	Comment
Active cell			Cell 1 Cell 2	Cell 1 is PCell on E-UTRA TDD RF channel number 1, and cell 2 is PSCell on E-UTRA FDD RF channel number 2
CP length			Normal	
E-UTRA RF Channel Number			1, 2	One E-UTRA TDD carrier frequency and one E-UTRA FDD carrier frequency are used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	5, 10, 20	
Correlation Matrix and Antenna Configuration			2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [2] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		5MHz: 3 10MHz: 2 20MHz: 2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρA, ρB		-3	
	Ratio of PDCCH to RS EPRE	dB	1	
	Ratio of PCFICH to RS EPRE	dB	1	
DRX cycle on cell 1		ms	640	See Table 7.3.45.5-2
DRX cycle on cell 2		ms	40	See Table 7.3.45.5-2
Timing offset between cell 1 and cell 2		μs	33	For synchronous dual connectivity
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1; N313 = 1; N314 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	0	T313 is disabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.8	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.45.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.45.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.45.5-1 as appropriate for BW dependant parameters. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.45.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.45.5-1. T3 starts.

7. If the SS on Cell2:
   a) detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the subframe according the configured CQI reporting mode (PUCCH 1-0) during the period from time point A to time point B
   and
   b) does not detect any uplink power higher than -48.5 dBm from time point C (900 ms after the start of T3) until T3 expires,
   the number of successful tests is increased by one.
   Otherwise the number of failed tests is increased by one.

8. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.45.5-1.

9. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3A-RF-DC1, according to TS 36.508 [7] clause 5.2A.2A.

10. Repeat steps 2-9 for all subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.45.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.45.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.45.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD, for Cell 1 (FDD)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.45.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.45.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.45.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.45.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.45.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.45.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms0		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.45.5 Test requirement

Table 7.3.45.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5, 10, 20			5, 10, 20		
Correlation Matrix and Antenna Configuration		2x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			-		
Uplink-downlink configuration[Note2]		1			-		
PCFICH/PDCCH/PHICH parameters None of the PDCCH are intended for the UE under test		5MHz: R.12 TDD 10MHz: R.7 TDD 20MHz: R.13 TDD			5MHz: R.12 FDD 10MHz: R.7 FDD 20MHz: R.13 FDD		
OCNG Pattern		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
ρA, ρB		-3			-3		
PCFICH_RB	dB	1			1		
PDCCH_RA	dB	1			1		
PDCCH_RB	dB	1			1		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note3]	dB						
OCNG_RB[Note3]	dB						
SNR [Note 8] (5MHz bandwidth)	dB	-1.6+TT	-1.6+TT	-1.6+TT	-2.3+TT	-5.7+TT	-12.2+TT
SNR [Note 8] (10MHz bandwidth)	dB	-2.3+TT	-2.3+TT	-2.3+TT	-2.3+TT	-6.2+TT	-12.2+TT
SNR [Note 8] (20MHz bandwidth)	dB	-3.0+TT	-3.0+TT	-3.0+TT	-2.9+TT	-6.8+TT	-12.8+TT
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Time offset to cell1 [Note 9]	μs	-			33		
CQI reporting periodicity	ms	1			2		

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.40.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.45.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.45.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, and T3 shall be as follows:

During time durations T1, T2 and T3, the UE shall transmit uplink signal at least in all subframes configured for CQI transmission on Cell1.

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe on Cell2.

The UE shall stop transmitting uplink signal no later than time point C (duration D1 = 900 ms after the start of time duration T3) on PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.46 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in FDD

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.46.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.46.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.46.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.46.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.46.

7.3.46.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.46.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

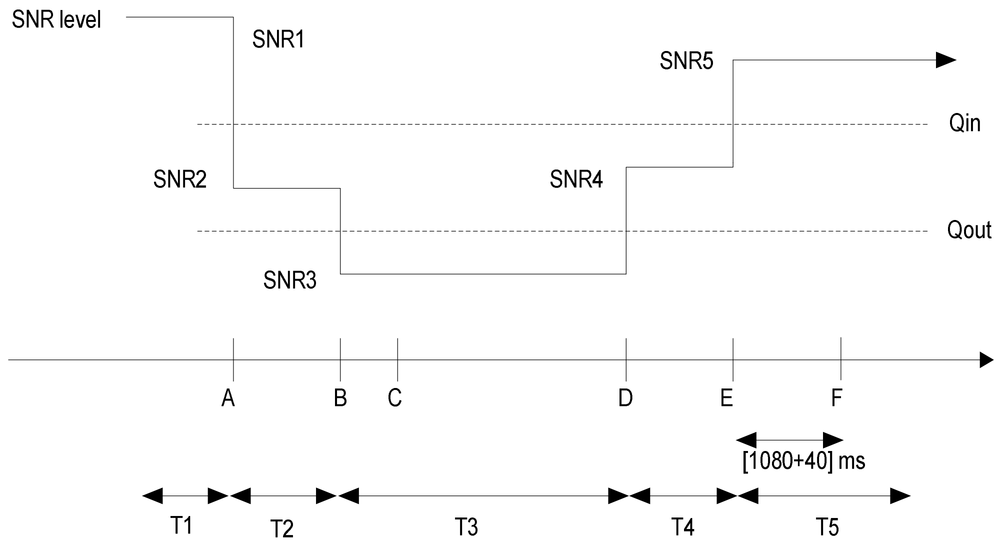

Figure 7.3.46.4-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.46.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.46.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.46.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.46.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.46.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One E-UTRA FDD carrier frequency and One E-UTRA TDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA FDD RF channel number 1, and cell 2 is PSCell on E-UTRA TDD RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table 7.3.46.5-2
DRX cycle on Cell 2		ms	40	See Table 7.3.46.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.				

7.3.46.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3C-RF, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.46.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.

4. Set the parameters according to T1 in Table 7.3.61.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.

5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.46.5-1. T2 starts.

6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.46.5-1. T3 starts.

7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.46.5-1. T4 starts.

8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.46.5-1. T5 starts.

9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.46.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.46.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.46.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.46.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.46.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.46.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.46.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.46.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.46.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.46.5 Test requirement

Table 7.3.46.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Parameter		Unit	Cell 1(PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
Special subframe configuration Note1			-	6				
Uplink-downlink configuration Note2			-	1				
PCFICH/PDCCH/PHICH parameters defined in A.3.1.2.1 and A.3.1.2.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				
OCNG Pattern defined in A.3.2.1 (FDD) and A.3.2.2 (TDD)			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA Note3		dB						
OCNG_RB Note3		dB						
SNR Note 8	5MHz $BW_{channel}$	dB	-2.3+TT	-5.1+TT	-9.1+TT	-13.1+TT	-9.1+TT	-5.1+TT
	10MHz $BW_{channel}$		-4.7+TT	-5.1+TT	-9.1+TT	-13.1+TT	-9.1+TT	-5.1+TT
	20MHz $BW_{channel}$		-4.7+TT	-5.1+TT	-9.1+TT	-13.1+TT	-9.1+TT	-5.1+TT
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 Note 9		µs	-	33				
CQI reporting periodicity		ms	2	1				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell 1 and cell 2 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR of Cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.46.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.46.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in FDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.46.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.47 E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

The Test system uncertainties applicable to this test are undefined

The Test tolerances applicable to this test are undefined

7.3.47.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PSCell when DRX is used in synchronous dual connectivity. This test will partly verify the E-UTRA radio link monitoring requirements in TS36.133[4] clause 7.6.

7.3.47.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE release 12 and forward that supports Dual Connectivity.

7.3.47.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133[4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell or PSCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell or PSCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The In-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer or T313 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link of PCell or PSCell for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer or T313 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer and the transmitter power of PSCell if configured shall be turned off within 40 ms after expiry of T313 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.47.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX}$ and $T_{Evaluate\_Qin\_DRX}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133[4] clause 7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note 1 (20)
0.04 < DRX cycle ≤ 0.64	Note 1 (10)
0.64 < DRX cycle ≤ 2.56	Note 1 (5)
Note 1: Evaluation period length in time depends on the length of the DRX cycle in use. Note 2: MCG's DRX configuration is applied for PCell RLM evaluation and SCG's DRX configuration is applied for PSCell RLM evaluation.	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.47.

7.3.47.4 Test description

There are two cells, cell 1 is PCell and cell 2 is PSCell, in the test. The test consists of five successive time periods with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.47.4-1 shows the variation of the downlink SNR in the PCell and PSCell to emulate in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms on cell 1 and 1ms on cell 2. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

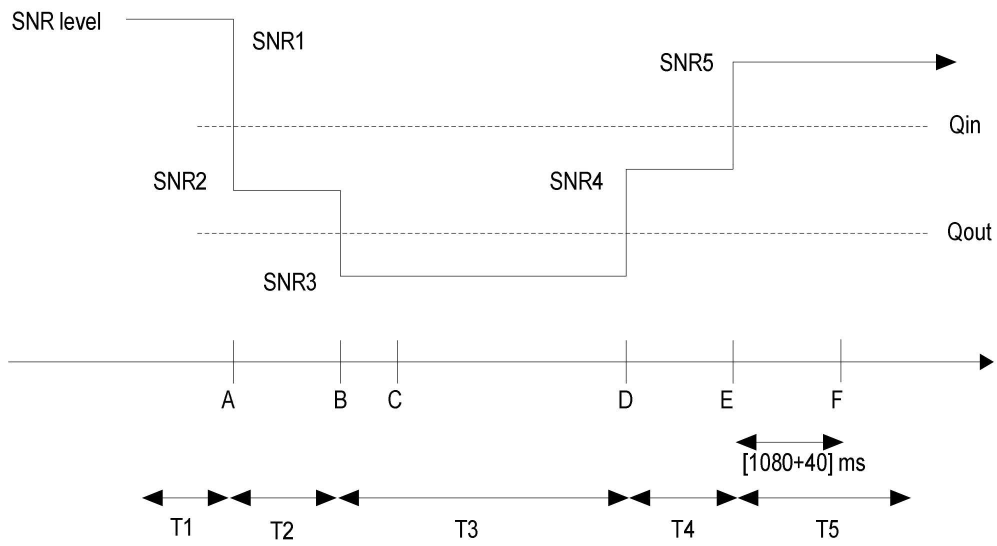

Figure 7.3.47.4-1 SNR variation of cell 2 (PSCell) for in-sync testing in DRX

7.3.47.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 7.3.47.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14 as appropriate.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.47.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.47.4.3.
5. There are two cells specified in this test, Cell 1 and Cell2. Cell 1 is the PCell on RF channel 1and Cell 2 is the PSCell on RF channel 2. Cell1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.47.4.1-1: General test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One E-UTRA TDD carrier frequency and One E-UTRA FDD carrier frequency are used.
Active cell			Cell 1, Cell 2	Cell 1 is PCell on E-UTRA TDD RF channel number 1, and cell 2 is PSCell on E-UTRA FDD RF channel number 2
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		1C	As defined in clause 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	4	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-2 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in clause 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	For 10MHz and 20MHz channel BW
	Number of Control OFDM symbols		3	For 5MHz channel BW
	Aggregation level	CCE	8	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133[4] clause 7.6.1 and Table 7.6.1-1 respectively.
	ρA, ρB		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle on Cell 1		ms	640	See Table 7.3.47.5-2
DRX cycle on Cell 2		ms	40	See Table 7.3.47.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1, N313 = 1, N314 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T313 timer		ms	2000	T313 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
T1		s	4	
T2		s	1.6	
T3		s	1.47	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in section 3A.5.				

7.3.47.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1 and cell 2.

1. Ensure the UE is in State 3A-RF-DC2 if UE supports DC Split DRB bearer, according to TS 36.508 [7] clause 5.2A.2B; else ensure the UE is in state 3C-RF, according to TS 36.508 [7] clause 5.2A.2A.

2. The SS shall transmit an RRCConnectionReconfiguration message configuring the UE with the message content defined in clause 7.3.47.4.3.

3. The UE shall transmit RRCConnectionReconfigurationComplete message.
4. Set the parameters according to T1 in Table 7.3.61.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
5. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.47.5-1. T2 starts.
6. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.47.5-1. T3 starts.
7. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.47.5-1. T4 starts.
8. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.47.5-1. T5 starts.
9. If the SS on Cell 2 detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
10. After T5 expires, repeat steps 2-9 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.47.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.47.4.3-1: Common Exception messages for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.47.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.47.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD, for cell 1

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf640	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.47.4.3-4: *MAC-MainConfig-RBC* E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD, for cell 2

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.47.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.47.4.3-6: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.47.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	20	5 MHz channel bandwidth parameter	To be set depending on BW under test
	41	10 MHz channel bandwidth parameter	
	84	20 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 7.3.47.4.3-8: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
rlf-TimersAndConstantsSCG-r12 CHOICE {			
setup SEQUENCE {			
t313-r12	ms2000		
n313-r12	n1		
n314-r12	n1		
}			
}			
}			

7.3.47.5 Test requirement

Table 7.3.47.5-1: Cell specific test parameters for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Parameter		Unit	Cell 1(PCell)	Cell 2 (PSCell)				
			T1 ~ T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number			1	2				
$BW_{channel}$		MHz	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100	5: $N_{RB,c}$ = 25 10: $N_{RB,c}$ = 50 20: $N_{RB,c}$ = 100				
Special subframe configuration[Note1]			6	-				
Uplink-downlink configuration[Note2]			1	-				
PCFICH/PDCCH/PHICH parameters defined in A 2.1 and A. 2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				
OCNG Pattern defined in D.1 (FDD) and D.2 (TDD)			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				
ρ_A, ρ_B			0	0				
PCFICH_RB		dB	4	4				
PDCCH_RA		dB	0	0				
PDCCH_RB		dB	0	0				
PBCH_RA		dB	0	0				
PBCH_RB		dB						
PSS_RA		dB						
SSS_RA		dB						
PHICH_RA		dB						
PHICH_RB		dB						
PDSCH_RA		dB						
PDSCH_RB		dB						
OCNG_RA[Note1]		dB						
OCNG_RB[Note1]		dB						
SNR [Note 6]	5MHz $BW_{channel}$	dB	-5.1+TT	-2.3+TT	-5.7+TT	-12.2+TT	-7.3+TT	-2.3+TT
	10MHz $BW_{channel}$		-5.1+TT	-4.7+TT	-9.5+TT	-13.5+TT	-8.7+TT	-4.7+TT
	20MHz $BW_{channel}$		-5.1+TT	-4.7+TT	-9.5+TT	-13.5+TT	-8.7+TT	-4.7+TT
N_{oc}		dBm/15 kHz	-98					
Propagation condition			AWGN	AWGN				
Correlation Matrix and Antenna Configuration			1x2	1x2				
Receive time offset to cell1 [Note 9]		μs	-	33				
CQI reporting periodicity		ms	1	2				

Note 1: For the special subframe configuration see table 4.2-1 in TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR of Cell 2 in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.47.1-1.
Note 9: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 7.3.47.5-2: DRX-Configuration for E-UTRAN TDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC with PCell in TDD

Field	Value		Comment
	Cell 1	Cell 2	
onDurationTimer	psf2	psf2	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf640	Sf40	
shortDRX	disable	disable	

Table 7.3.47.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in synchronous DC

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section 10.1 in TS 36.213 [8].

The UE behaviour during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0) on PCell and PSCell.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A

7.3.48.1 Test purpose

The purpose of this test is to verify that the FD-FDD Cat-M1 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN FDD radio link monitoring requirements for Cat-M1 UE defined in clause 7.19.

7.3.48.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1.

7.3.48.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.53.

7.3.48.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.48.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 2 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the *RRC parameter mPDCCH-NumRepetition* is set to 8. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

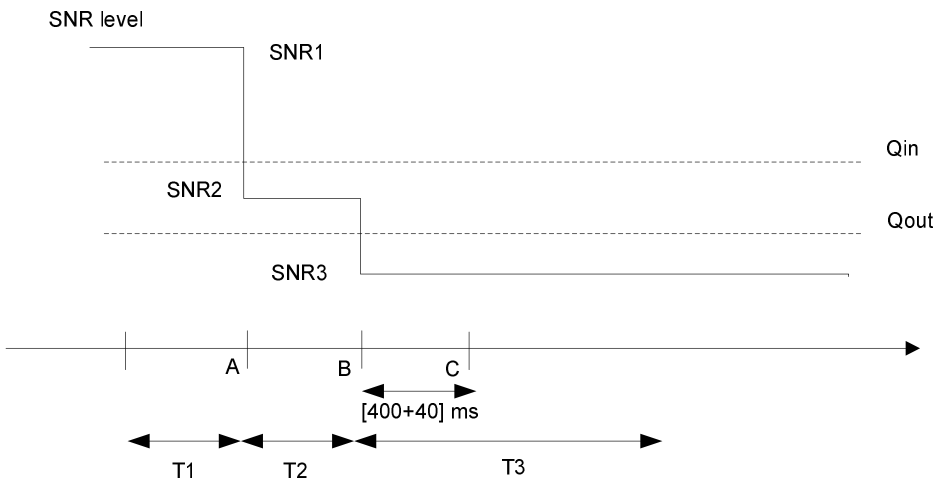

Figure 7.3.48.4-1: SNR variation for out-of-sync testing

7.3.48.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.48.4.1-1.

3. Propagation conditions are set according to Annex B clause B.2.

4. Message contents are defined in clause 7.3.48.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.48.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync testing for UE Cat-M1 in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4]
	M-PDCCH aggregation level	eCCE	24	
	M-PDCCH repetition level		8	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.48.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CE Mode A according to TS 36.508 [7] clause 7.2A.3AA .

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.48.4.1-1.

3. Set the parameters according to T1 in Table 7.3.48.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.48.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.48.5-1. T3 starts.

6. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

b) does not detect any uplink power higher than -48.5 dBm from time point C (440 ms after the start of T3) until T3 expires, the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.48.5-1.
8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CE ModeA activated according to TS 36.508 [7] clause 7.2A.3AA.
9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.48.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.48.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.48.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for CAT_M1 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.48.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for CAT_M1 UE

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

7.3.48.5 Test requirement

Table 7.3.48.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter	**Unit**	**Test 1**		
		T1	**T2**	**T3**
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters as defined in A.3.1.3.1		R.17 FDD		
OCNG Pattern defined in A.3.2.1.21 (FDD)		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	1.0	-5.9	-16.7
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.48.4.1-1.				

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (440 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- RLM IS timing would need a update

7.3.49.1 Test purpose

The purpose of this test is to verify that the FD-FDD Cat-M1 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN FDD radio link monitoring requirements for Cat-M1 UE defined in clause 7.19.

7.3.49.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1.

7.3.49.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.49.

7.3.49.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.49.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 2 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the *RRC parameter mPDCCH-NumRepetition* is set to 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

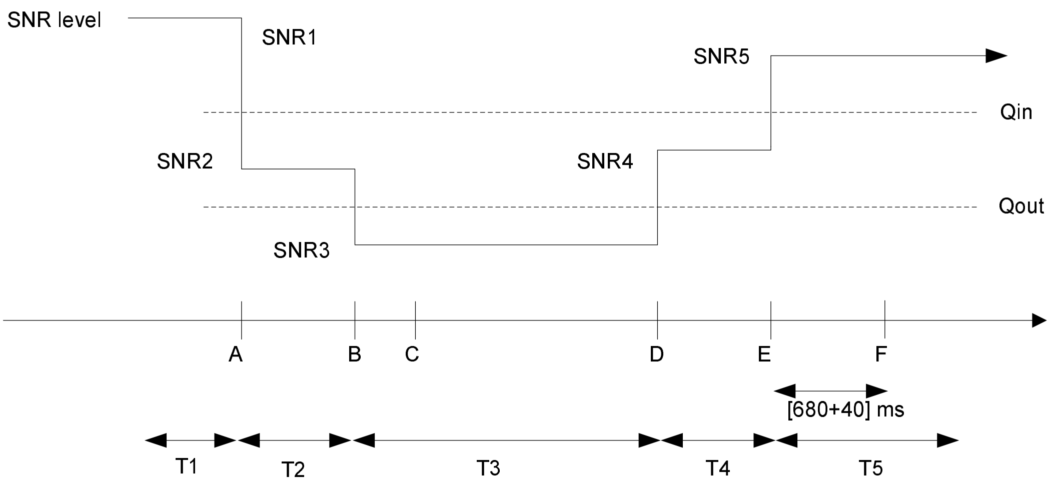

Figure 7.3.49.4-1: SNR variation for in-sync testing

7.3.49.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.49.4.1-1.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.49.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.49.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync testing for UE Cat-M1 in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold Q_{in} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4]..
	M-PDCCH aggregation level	eCCE	4	
	M-PDCCH repetition level		2	
	ρ_A, ρ_B		-3	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4]..
	M-PDCCH aggregation level	eCCE	16	
	M-PDCCH repetition level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.36	
T4		s	0.4	
T5		s	2	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.49.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CE Mode A according to TS 36.508 [7] clause 7.2A.3AA.

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.49.4.1-1.

3. Set the parameters according to T1 in Table 7.3.49.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.49.5-1. T2 starts.
5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.49.5-1. T3 starts.
6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.49.5-1. T4 starts.
7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.49.5-1. T5 starts.
8. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (680+40 ms after the start of time duration T5) the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

9. After T5 expires, repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved

7.3.49.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.49.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category CAT-M1

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.49.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category CAT-M1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.49.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for in-sync for UE category CAT-M1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
numberPRB-Pairs-v1310 CHOICE {			
setup	n4		
}			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r4		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

7.3.49.5 Test requirement

Table 7.3.49.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for in-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters as defined in A.3.1.3.1		R.17 FDD				
OCNG Pattern defined in A.3.2.1.21 (FDD)		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	6.3	-2.9	-13.7	-2.5	6.3
Propagation condition		ETU 30Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.49.4.1-1.						

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F ([680+40] ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.50 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A

Editor’s note: This test case is incomplete. The following aspects are either missing or not yet determined

- The SNRs are TBD
- UE Transmit minimum power and Transmit OFF power are TBD for a carrier frequency above 3GHz
- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Annex E needs to be updated

7.3.50.1 Test purpose

The purpose of this test is to verify that the FD-FDD category M1 UE configured in CEMode A properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in TS 36.133 Section 7.19 [4].

7.3.50.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.3.50.3 Minimum conformance requirements

The UE Cat-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out\_Cat\ M1}$ and $Q_{in\_Cat\ M1}$ for the purpose of monitoring downlink radio link quality of the PCell.

When DRX is used for FD-FDD and TDD category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7.3.50.3-1 (TS 36.133 [4] Table 7.19.2.2-1) will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7.3.50.3-2 (TS 36.133 [4] Table 7.19.2.2-2) will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.50.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use.	

Table 7.3.50.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use.	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.50.

The test parameters are given in Tables 7.3.50.4.1-1, 7.3.50.5-1, 7.3.50.5-2 and 7.3.50.5-3.

7.3.50.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.50.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync states.

There are two sets of values for MPDCCH aggregation level and MPDCCH repetition level, respectively. In each run of the test, the test equipment randomly selects one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level, and sends the RRC configuration to the UE. MPDCCH aggregation level is determined by RRC parameter *numberPRB-Pairs*, and value 6 and 4 are corresponding to Set 1 and Set 2, respectively. MPDCCH repetition level is determined by RRC parameter *mPDCCH-NumRepetition,* and value 8 and 4 are corresponding to Set 1 and Set 2, respectively. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

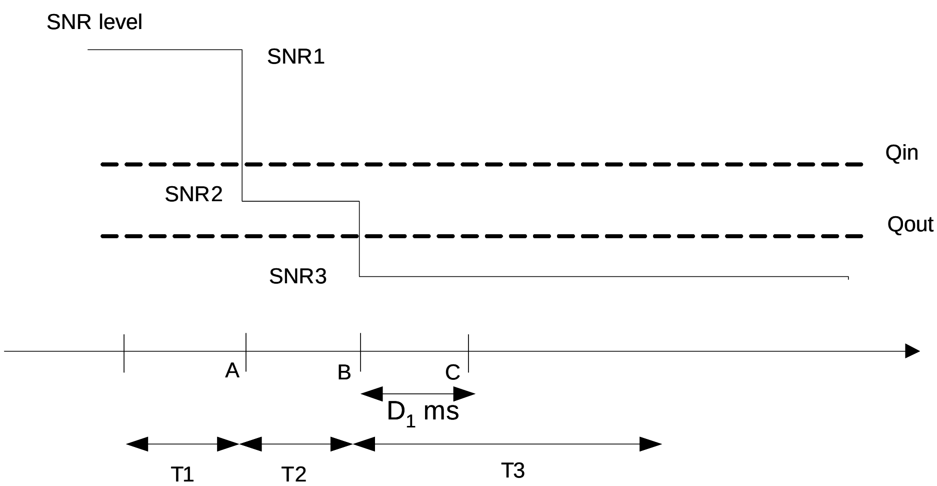

Figure 7.3.50.4-1: SNR variation for out-of-sync testing in DRX

7.3.50.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A. 10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.50.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 7.3.50.4.3.
5. There is one cell and one E-UTRA FD-FDD carrier specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.50.4.1-1: General test parameters for E-UTRAN FD-FDD out-of-sync tests in DRX for UE category M1 configured in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212 [31]
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in TS 36.133 [4] clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	Set 1: 24 Set 2:16	
	MPDCCH repetition level		Set 1: 8 Set 2: 4	
	Ratio of MPDCCH to RS EPRE		0	
	ρ_A, ρ_B		-3	
DRX cycle		Ms	1280	See Table 7.3.50.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		Ms	0	T310 is disabled
T311 timer		Ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		Ms	2	Minimum CQI reporting periodicity
T1		S	32	
T2		S	12.8	
T3		S	13	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.50.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.50.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.50.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.50.5-1. T3 starts.
5. If the SS a) detects uplink power equal to or higher than [-39] dBm (as defined in TS 36.521-1[10] clause 6.3.2.5 for carrier frequency less than [3]GHz) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B, and b) does not detect any uplink power higher than [-48.5] dBm (as defined in TS 36.521-1[10] clause 6.3.3.5 for carrier frequency less than [3]GHz) from time point C (6500 ms (D1) after the start of T3) until T3 expires, then the number of successful tests is increased by one. Otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.50.5-1.
7. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.50.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.50.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.50.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULTT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig- DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-	
1B and clause 7.2.2 in TS 36.213 [8])			
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.50.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Sf1280 typical value in real network for real-time services.	
Sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.50.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.50.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX in UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.50.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for Out-of-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.50.5 Test requirement

Table 7.3.50.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category M1 configured in CEMode A

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters defined in A.3.1.3		R.17 FDD Note 7		
OCNG Pattern defined in A.3.2.1 (FDD)		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	TBD	TBD	TBD
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.50.4-1.
Note 7: Aggregation level and repetition level specified in Table 7.3.50.4.1-1 are used for this test.

Table 7.3.50.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync tests for UE category M1 configured in CEMode A

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.50.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync testing for UE category M1 configured in CEMode A

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section 10.1 in TS 36.213 [8].

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power [-39] dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5 for f<3GHz) means uplink signal,
- UE output power equal to or less than Transmit OFF power [-48.5] dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5 for f<3GHz) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 Configured in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The SNRs are TBD
- UE Transmit minimum power is TBD for a carrier frequency above 3GHz ([-39 dBm])
- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Annex E needs to be updated

7.3.51.1 Test purpose

The purpose of this test is to verify that the FD-FDD category M1 UE configured in CEMode A properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN FD-FDD radio link monitoring requirements in clause 7.19.

7.3.51.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.3.51.3 Minimum conformance requirements

The UE category M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 is defined in Section 3.6.

When DRX is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7. 3.51.3-1 will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7. 3.51.3-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.51.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use.	

Table 7.3.51.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use.	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.51.

7.3.51.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.51.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

There are two sets of values for MPDCCH aggregation level and MPDCCH repetition level, respectively. In each run of the test, the test equipment randomly selects one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level, and sends the RRC configuration to the UE. MPDCCH aggregation level is determined by RRC parameter *numberPRB-Pairs*, and value 6 and 4 are corresponding to Set 1 and Set 2, respectively. MPDCCH repetition level is determined by RRC parameter *mPDCCH-NumRepetition*, and value 8 and 4 are corresponding to Set 1 and Set 2, respectively. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

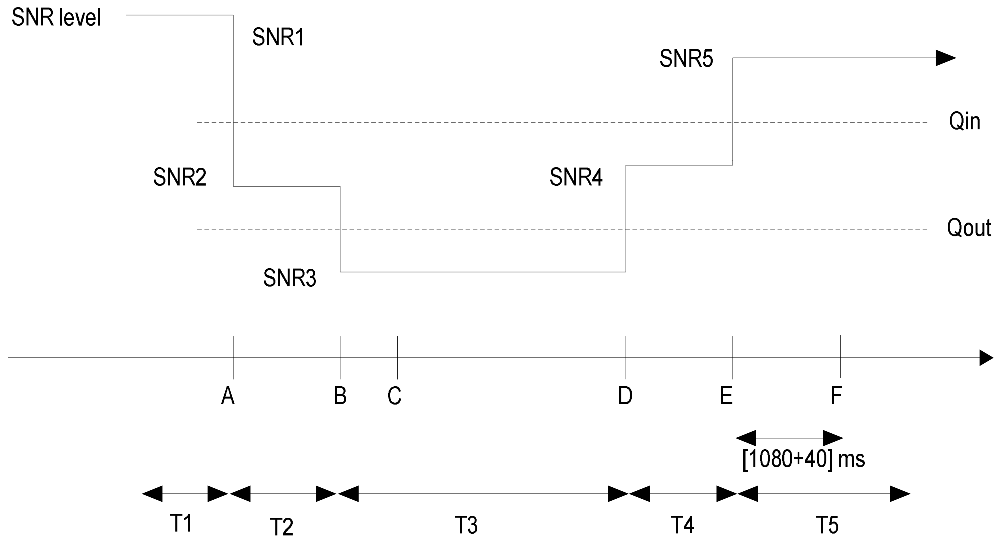

Figure 7.3.51.4-1: SNR variation for in-sync testing in DRX

7.3.51.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.51.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.51.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.51.4.1-1: General test parameters for E-UTRAN FD-FDD in-sync test in DRX for UE category M1 configured in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold $Q_{in, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	Set 1: 8 Set 2:4	
	MPDCCH repetition level		Set 1: 4 Set 2: 2	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	Set 1: 24 Set 2:16	
	MPDCCH repetition level		Set 1: 8 Set 2: 4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	40	See Table 7.3.51.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.51.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.51.5-1. The SS shall select randomly one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.51.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.51.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.51.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.51.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than [-39 dBm] (as defined in TS 36.521-1 clause 6.3.2.5 for carrier frequency less than [3]GHz) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.51.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.51.4.3-1: Common Exception messages for E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.51.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.51.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.51.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.51.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.51.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.51.5 Test requirement

Table 7.3.51.5-1: Cell specific test parameters for E-UTRAN FD-FDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category M1 configured in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters defined in A.3.1.3		R.17 FDD Note 7				
OCNG Pattern defined in A.3.2.1 (FDD)		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	TBD	TBD	TBD	TBD	TBD
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.51.4-1. Note 7: Aggregation level and repetition level specified in Table 7.3.51.4.1-1are used for this test.						

Table 7.3.51.5-2: DRX-Configuration for E-UTRAN FD-FDD out-of-sync tests for UE category M1 configured in CEMode A

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.51.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FD-FDD out-of-sync testing for UE category M1 configured in CEMode A

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power [-39 dBm] (as defined in TS 36.521-1 [10] clause 6.3.2.5 for carrier frequency less than [3] GHz) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.52 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category CAT-M1

7.3.52.1 Test purpose

The purpose of this test is to verify that the HD-FDD Cat-M1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.19.

7.3.52.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category M1.

7.3.52.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.53.

7.3.52.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.52.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 2 ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 6 and the *RRC parameter mPDCCH-NumRepetition* is set to 8. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

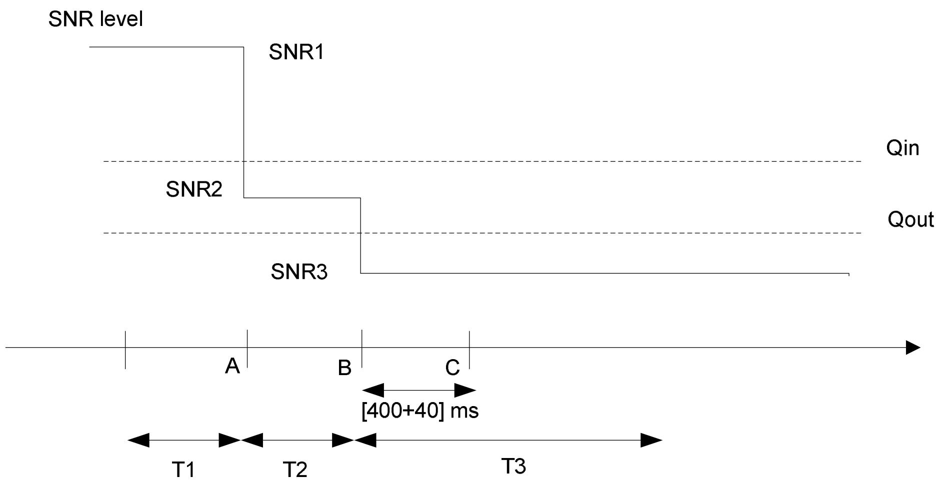

Figure 7.3.52.4-1: SNR variation for out-of-sync testing

7.3.52.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.52.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.52.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.52.4.1-1: General test parameters for E-UTRAN HD-FDD out-of-sync testing for UE Cat-M1 in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Qout and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4].
	M-PDCCH aggregation level	eCCE	24	
	M-PDCCH repletion level		8	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	20	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH transmission parameters corresponding to the in-sync and out of sync transmission need not be included in the Reference Measurement Channel.				

7.3.52.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CE Mode A according to TS 36.508 [7] clause 7.2A.3AA .

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.52.4.1-1.

3. Set the parameters according to T1 in Table 7.3.52.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.52.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.52.5-1. T3 starts.

6. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

and

b) does not detect any uplink power higher than -48.5 dBm from time point C (440 ms after the start of T3) until T3 expires, the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.52.5-1.
8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CE ModeA activated according to TS 36.508 [7] clause 7.2A.3AA.
9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.52.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.52.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for category CAT-M1 UE

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.52.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category CAT-M1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	17	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.52.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category CAT-M1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
numberPRB-Pairs-v1310 CHOICE {			
setup	n6		
}			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r8		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

7.3.52.5 Test requirement

Table 7.3.52.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for out-of-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
MPDCCH parameters as defined in A.3.1.3.1		R.7 HD-FDD		
OCNG Pattern defined in A.3.2.1.21 (FDD)		OP.21 FDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	1.0	-5.9	-16.7
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.x5.1-1.				

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (440 ms after the start of time duration T3).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal
- UE output power equal to or less than Transmit OFF power -48.5 dBm (as defined in TS 36.521-1 [10] clause 6.3.3.5) means no uplink signal.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category CAT-M1

7.3.53.1 Test purpose

The purpose of this test is to verify that the HD-FDD Cat-M1 UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.19.

7.3.53.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1.

7.3.53.3 Minimum conformance requirements

The UE category M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 is defined in Section 3.6 of TS 36.133 [4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.53.

7.3.53.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.53.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of [[FFS]] ms.

In the test, the RRC parameter *numberPRB-Pairs* is set to 4 and the *RRC parameter mPDCCH-NumRepetition* is set to 4. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

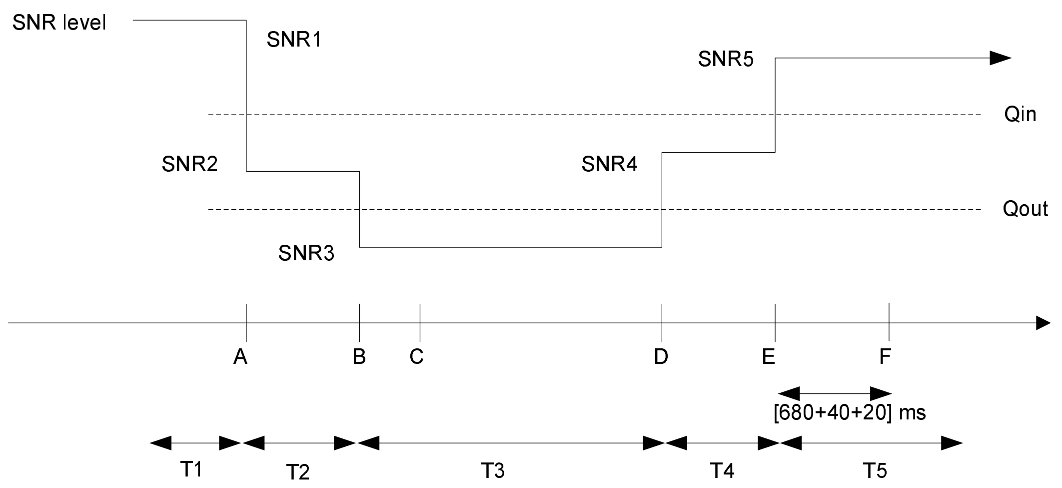

Figure 7.3.53.4-1: SNR variation for in-sync testing

7.3.53.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.53.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.53.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.53.4.1-1: General test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold Q_{in} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4]..
	M-PDCCH aggregation level	eCCE	4	
			2	
	ρ_A, ρ_B		-3	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4]..
	M-PDCCH aggregation level	eCCE	16	
	M-PDCCH repletion level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213 [8].
CQI reporting periodicity		ms	20	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.36	
T4		s	0.4	
T5		s	2	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.53.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of [[FFS]] ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CE Mode A according to TS 36.508 [7] clause 7.2A.3AA.

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.53.4.1-1.

3. Set the parameters according to T1 in Table 7.3.53.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.53.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.53.5-1. T3 starts.

6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.53.5-1. T4 starts.

7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.53.5-1. T5 starts.

8. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (740 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

9. After T5 expires, repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.53.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.53.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category CAT-M1

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.53.4.3-2: *CQI-ReportConfig-DEFAULT:* E-UTRAN HD-FDD Radio Link Monitoring Test for in-sync for UE category CAT-M1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	17	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.52.4.3-3: *EPDCCH-Config-r11-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category CAT-M1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2B EPDCCH-Config-r11-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
numberPRB-Pairs-v1310 CHOICE {			
setup	n4		
}			
mpdcch-config-r13 CHOICE {			
setup SEQUENCE {			
csi-NumRepetitionCE-r13	v4		
mpdcch-pdsch-HoppingConfig-r13	on		
mpdcch-StartSF-UESS-r13 CHOICE {			
fdd-r13	v1		
}			
mpdcch-NumRepetition-r13	r4		
mpdcch-Narrowband-r13	1	Narrowband index 0	
}			
}			

7.3.53.5 Test requirement

Table 7.3.53.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters as defined in A.3.1.3.1		R.7 HD-FDD				
OCNG Pattern defined in A.3.2.1.21 (FDD)		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note 1	dB					
OCNG_RB Note 1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	6.3	-2.9	-13.7	-2.5	6.3
Propagation condition		ETU 30Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.53.4.1-1.						

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (740 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

7.3.54

7.3.55 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The CQI reporting periodicity and SNR are TBD
- UE Transmit minimum power is TBD for a carrier frequency above 3GHz ([-39 dBm])
- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Annex E needs to be updated

7.3.55.1 Test purpose

The purpose of this test is to verify that the HD-FDD category M1 UE configured in CEMode A properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN HD-FDD radio link monitoring requirements in TS 36.133 [4] Section 7.19.

7.3.55.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.3.55.3 Minimum conformance requirements

The UE category M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.1.

When DRX is used for HD-FDD category M1 with CE mode A UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Qout\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Qin\_DRX\_CatM1}$) specified in Table 7.3.55.3-1 (TS 36.133 [4] Table 7.19.3.2-1) will be used.

When eDRX_CONN cycle is used for HD-FDD category M1 with CE mode A UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_Qout\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_Qin\_DRX\_CatM1}$) specified in Table 7.3.55.3-2 (TS 36.133 [4] Table 7.19.3.2-2) will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Qout\_DRX\_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_Qout\_DRX\_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_Qin\_DRX\_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_Qin\_DRX\_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.55.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for HD-FDD UE category M1 with CE mode A

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.3.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (40)
0.04 < DRX cycle ≤ 0. 16	Note (20)
0. 16 < DRX cycle ≤ 0.64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use.	

Table 7.3.55.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for HD-FDD UE category M1 with CE mode A

eDRX_CONN cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use.	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.3 and A.7.3.55.

7.3.55.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.55.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of TBD ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

There are two sets of values for MPDCCH aggregation level and MPDCCH repetition level, respectively. In each run of the test, the test equipment randomly selects one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level, and sends the RRC configuration to the UE. MPDCCH aggregation level is determined by RRC parameter *numberPRB-Pairs*, and value 6 and 4 are corresponding to Set 1 and Set 2, respectively. MPDCCH repetition level is determined by RRC parameter *mPDCCH-NumRepetition*, and value 8 and 4 are corresponding to Set 1 and Set 2, respectively. UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

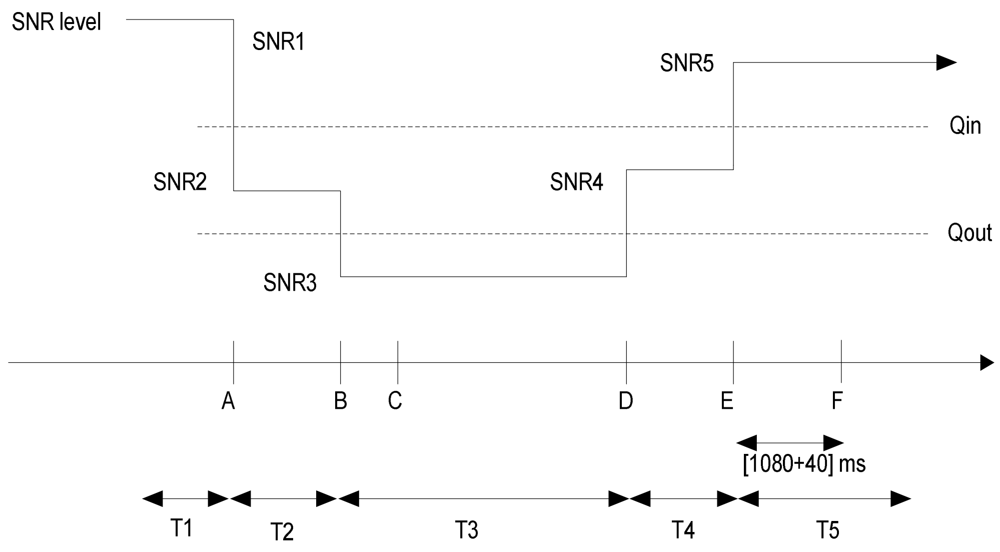

Figure 7.3.55.4-1: SNR variation for in-sync testing in DRX

7.3.55.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 (without using the faders) using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.55.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.55.4.3.

5. There is one cell and one E-UTRA HD-FDD carrier specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.55.4.1-1: General test parameters for E-UTRAN HD-FDD in-sync test in DRX for UE category M1 with CE mode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold $Q_{in, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	Set 1: 8 Set 2:4	
	MPDCCH repetition level		Set 1: 4 Set 2: 2	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively
	MPDCCH aggregation level	eCCE	Set 1: 24 Set 2:16	
	MPDCCH repetition level		Set 1: 8 Set 2: 4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	40	See Table 7.3.55.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213
CQI reporting periodicity		ms	TBD	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.55.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of TBD ms.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 7.3.55.5-1. The SS shall select randomly one set of values (Set 1 or Set 2) for both MPDCCH aggregation level and MPDCCH repetition level. Propagation conditions are set according to Annex B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.55.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.55.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.55.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.55.5-1. T5 starts.

7. If the SS detects uplink power equal to or higher than [-39] dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

8. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.55.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.55.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 with CE mode A

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.55.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	TBD	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.55.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf20		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.55.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.55.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.55.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD Radio Link Monitoring test for In-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.55.5 Test requirement

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power [-39] dBm (as defined in TS 36.521-1 [10] clause 6.3.2.5) means uplink signal

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

Table 7.3.55.5-1: Cell specific test parameters for E-UTRAN HD-FDD (cell # 1) for in-sync radio link monitoring test in DRX for UE category M1 configured in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
MPDCCH parameters defined in A.3.1.3		R.7 HD-FDD Note 7				
OCNG Pattern defined in A.3.2.1 (FDD)		OP.21 FDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	TBD	TBD	TBD	TBD	TBD
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.55.4-1.
Note 7: Aggregation level and repetition level specified in Table 7.3.55.4.1-1 are used for this test.

Table 7.3.55.5-2: DRX-Configuration for E-UTRAN HD-FDD out-of-sync tests for UE category M1 configured in CEMode A

Field	Value	Comment
onDurationTimer	psf20	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.55.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD in-sync radio link monitoring tests in DRX for UE category M1 with CE mode A

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213 [5].

7.3.56 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Test Tolerances need to be completed

- Annex E updates are pending

- Message contents are FFS.

- SNR values are in [] (square brackets)

7.3.56.1 Test purpose

The purpose of this test is to verify that the TDD Cat-M1 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN TDD radio link monitoring requirements for Cat-M1 UE defined in TS 36.133[4] clause 7.19.

7.3.56.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1.

7.3.56.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.56.

7.3.56.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.56.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

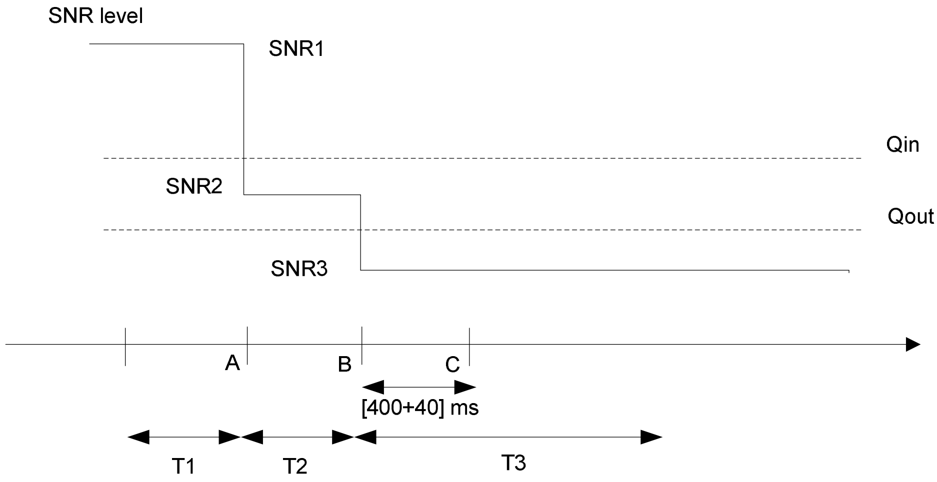

Figure 7.3.56.4-1: SNR variation for out-of-sync testing

7.3.56.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.56.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0
4. Message contents are defined in clause 7.3.56.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.56.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing for UE Cat-M1 in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively.
	M-PDCCH aggregation level	eCCE	24	
	M-PDCCH repetition level		8	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.8	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.56.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CE Mode A according to TS 36.508 [7] clause 7.2A.3AA .

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.56.4.1-1

3. Set the parameters according to T1 in Table 7.3.56.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.56.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.56.5-1. T3 starts.

6. If the SS:
   a) detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B

   and

   b) does not detect any uplink power higher than -48.5 dBm from time point C (440 ms after the start of T3) until T3 expires, the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.56.5-1.

8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE with CE ModeA activated according to TS 36.508 [7] clause 7.2A.3AA.

9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.56.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.56.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A

Default Message Contents	
Common contents of system information blocks exceptions	Table [FFS]
Default RRC messages and information elements contents exceptions	

7.3.56.5 Test requirement

Table 7.3.56.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration Note 1		6		
Uplink-downlink configuration Note 1		1		
MPDCCH parameters as defined in A.7.3		R.15 TDD Note 8		
OCNG Pattern defined in D.2.11 (TDD)		OP.11 TDD		
ρ_A, ρ_B		-3		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 7	dB	[-0.5]	[-7.3]	[-16.3]
Propagation condition		ETU 30Hz		
Correlation Matrix and Antenna Configuration		2x1 Low		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.56.4-1.
Note 8: Aggregation level and repetition levels specified in 7.3.56.4-1 are used for this test.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (440 ms after the start of time duration T3).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.57 E-UTRAN TDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Test Tolerances need to be completed

- Annex E updates are pending
- Message contents are FFS.
- SNR values are in [] (square bracket)

7.3.57.1 Test purpose

The purpose of this test is to verify that the TDD Cat-M1 UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the PCell in CEModeA. This test will partly verify the E-UTRAN TDD radio link monitoring requirements for Cat-M1 UE defined in TS 36.133[4] clause 7.19.

7.3.57.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1.

7.3.57.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring is defined in Section 3.6 of TS 36.133[4].

When the downlink radio link quality of the PCell estimated over the last 400 ms period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send an out-of-sync indication for the PCell to the higher layers within 400 ms Q_{out_CatM1} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last 200 ms period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send an in-sync indication for the PCell to the higher layers within 200 ms Q_{in_CatM1} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10ms.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2, 7.19.3 and A.7.3.57.

7.3.57.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.57.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 1 ms.

UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

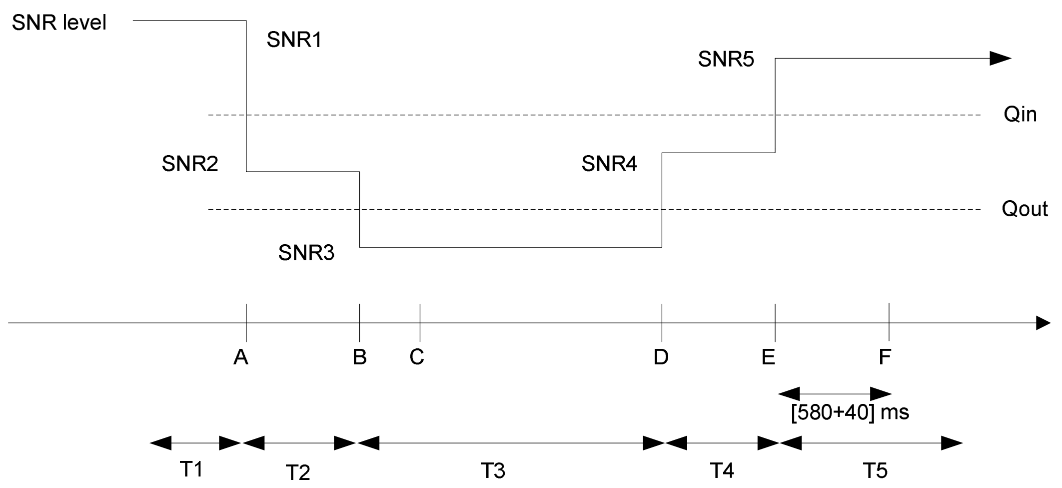

Figure 7.3.57.4-1: SNR variation for in-sync testing

7.3.57.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.57.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0
4. Message contents are defined in clause 7.3.57.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.57.4.1-1: General test parameters for E-UTRAN TDD in-sync testing for UE Cat-M1 in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold Q_{in} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively.
	M-PDCCH aggregation level	eCCE	4	
			2	
	ρ_A, ρ_B		-3	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold Q_{out} and the corresponding hypothetical MPDCCH transmission parameters are as specified in section 7.19.2 and Table 7.19.2-1 respectively.
	M-PDCCH aggregation level	eCCE	16	
	M-PDCCH repetition level		4	
	ρ_A, ρ_B		-3	
DRX			OFF	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	2	
T2		s	0.8	
T3		s	1.36	
T4		s	0.4	
T5		s	2	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.57.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode without repetition with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A-RF-CE with the condition CE Mode A according to TS 36.508 [7] clause 7.2A.3AA.

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.57.4.1-1

3. Set the parameters according to T1 in Table 7.3.57.5-1. Propagation conditions are set according to Annex B.2. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.57.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.57.5-1. T3 starts.
6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.57.5-1. T4 starts.
7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.57.5-1. T5 starts.
8. If the SS detects uplink power equal to or higher than -39 dBm in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (620 ms after the start of time duration T5) the number of successful tests is increased by one.

Otherwise the number of failed tests is increased by one.

9. After T5 expires, repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.57.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.57.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync for UE category CAT-M1

Default Message Contents	
Common contents of system information blocks exceptions	FFS
Default RRC messages and information elements contents exceptions	

7.3.57.5 Test requirement

Table 7.3.57.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring tests for Cat-M1 in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration Note 1		6				
Uplink-downlink configuration Note 1		1				
MPDCCH parameters as defined in A.7.3.		R.15 TDD				
OCNG Pattern defined in D.2.11 (TDD)		OP.11 TDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note 2	dB					
OCNG_RB Note 2	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 6	dB	[5.0]	[-4.2]	[-13.2]	[-2.0]	[5.0]
Propagation condition		ETU 30Hz				
Correlation Matrix and Antenna Configuration		2x1 Low				

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 4: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 5: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 6: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 7: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.57.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F ([680+40] ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.58 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- UE Transmit minimum power and Transmit OFF power are TBD for a carrier frequency above 3GHz
- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Annex E needs to be updated
- SNR values are in [] (square bracket)

7.3.58.1 Test purpose

The purpose of this test is to verify that the TDD category M1 UE configured in CEMode A properly detects the out of sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133[4] clause 7.19.

7.3.58.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.3.58.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 of TS 36.133[4] is defined in Section 3.6 of TS 36.133[4].

When DRX is used for FD-FDD and TDD category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7.3.58.3-1 (TS 36.133 [4] Table 7.19.2.2-1) will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7.3.58.3-2 (TS 36.133 [4] Table 7.19.2.2-2) will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.58.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX\_CatM1}$ and $T_{Evaluate\_Qin\_DRX\_CatM1}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in TS36.133 [4] clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use	

Table 7.3.58.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_Qout\_DRX\_CatM1}$ and $T_{Evaluate\_Qin\_DRX\_CatM1}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.58.

The test parameters are given in Tables 7.3.58.4.1-1, 7.3.58.5-1, 7.3.58.5-2 and 7.3.58.5-3.

7.3.58.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.58.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

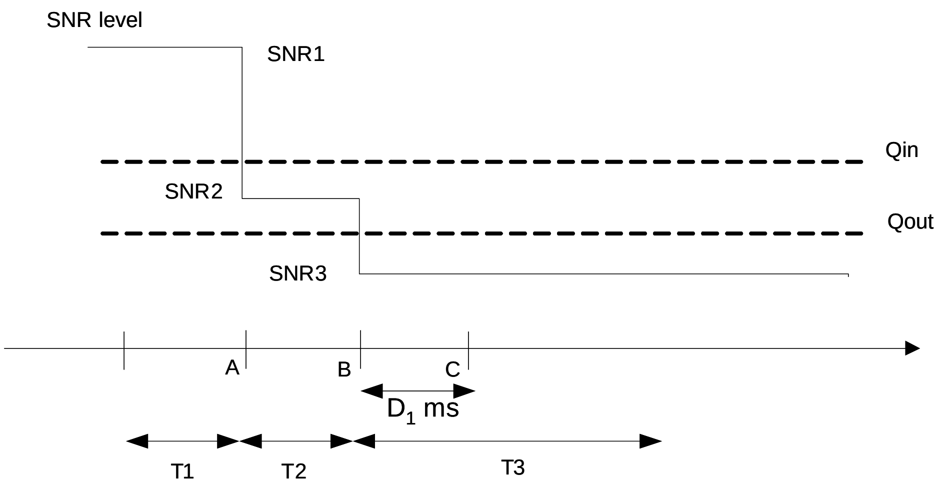

Figure 7.3.58.4-1: SNR variation for out-of-sync testing in DRX

7.3.58.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.58.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0

4. Message contents are defined in clause 7.3.58.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.58.4.1-1: General test parameters for E-UTRAN TDD out-of-sync tests in DRX for UE category M1 configured in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out,\ Cat\ M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	16	
	MPDCCH repetition level		4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	1280	See Table A.7.3.58.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	T310 is disabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	32	
T2		s	12.8	
T3		s	13	
Note 1: MPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.58.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.58.4.1-1.
3. Set the parameters according to T1 in Table 7.3.58.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.58.5-1. T2 starts.
5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.58.5-1. T3 starts.
6. If the SS a) detects uplink power equal to or higher than [-39] dBm (as defined in TS 36.521-1[10] clause 6.3.2.5 for carrier frequency less than [3]GHz) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point B, and b) does not detect any uplink power higher than [-48.5] dBm (as defined in TS 36.521-1[10] clause 6.3.3.5 for carrier frequency less than [3]GHz) from time point C (6500 ms (D1) after the start of T3) until T3 expires, then the number of successful tests is increased by one. Otherwise the number of failed tests is increased by one.
7. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.58.5-1.
8. If the UE has not re-established the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.
9. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.58.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.58.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-1
Default RRC messages and information elements contents exceptions	

Table 7.3.58.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULTT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig- DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.58.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Sf1280 typical value in real network for real-time services.	
Sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.58.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.58.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX in UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.58.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.58.5 Test requirement

Table 7.3.58.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests in DRX for UE category M1 configured in CEMode A

Parameter	Unit	Test 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration		6		
Uplink-downlink configuration		1		
MPDCCH parameters defined in A.7.3		R.15 TDD		
OCNG Pattern defined in D.2.11 (TDD)		OP.11 TDD		
ρ_A, ρ_B		-3		
MPDCCH_RA	dB	0		
MPDCCH_RB	dB	0		
PBCH_RA	dB	-3		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
OCNG_RA Note1	dB			
OCNG_RB Note1	dB			
N_{oc}	dBm/15 kHz	-98		
SNR Note 6	dB	[-0.1]	[-7.17]	[-15.17]
Propagation condition		AWGN		
Correlation Matrix and Antenna Configuration		2x1		
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.58.1-1.				

Table 7.3.58.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync tests for UE category M1 configured in CEMode A

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 7.3.58.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync testing for UE category M1 configured in CEMode A

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (duration D_1 = 6500 ms after the start of time duration T3.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.59 E- UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- UE Transmit minimum power is TBD for a carrier frequency above 3GHz ([-39 dBm])

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Annex E needs to be updated

- SNR values are in [] (square bracket)

7.3.59.1 Test purpose

The purpose of this test is to verify that the TDD category M1 UE configured in CEMode A properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133[4] clause 7.19.

7.3.59.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

7.3.59.3 Minimum conformance requirements

The UE category CAT-M1 applicability of the requirements for performing radio link monitoring in subclause 7.19 of TS 36.133[4] is defined in Section 3.6 of TS 36.133[4].

When DRX is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7.3.59.3-1 will be used.

When eDRX_CONN cycle is used for FD-FDD and TDD UE category M1 UEs, the Q_{out_CatM1} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_CatM1}$) and the Q_{in_CatM1} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_CatM1}$) specified in Table 7.3.59.3-2 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] period becomes worse than the threshold Q_{out_CatM1}, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] period becomes better than the threshold Q_{in_CatM1}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in clause 4.2.1 in [3]. When DRX is used, two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length). When eDRX_CONN is used, two successive indications from Layer 1 shall be separated by at least max(10 ms, eDRX_CONN cycle length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2].

Table 7.3.59.3-1: Q_{out_CatM1} and Q_{in_CatM1} Evaluation Period in DRX for FD-FDD and TDD UE category M1

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in clause 7.19.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
NOTE: Evaluation period length in time depends on the length of the DRX cycle in use	

Table 7.3.59.3-2: Q_{out_CatM1} and Q_{in_CatM1} evaluation period when eDRX_CONN cycle is configured for FD-FDD and TDD UE category M1

eDRX_CONN cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_CatM1}$ and $T_{Evaluate\_}Q_{in\_DRX\_CatM1}$ (s) (eDRX_CONN cycles)
2.56 < eDRX_CONN cycle ≤ 10.24	Note (5)
NOTE: Evaluation period length in time depends on the length of the eDRX_CONN cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.19.1, 7.19.2 and A.7.3.59.

The test parameters are given in Tables 7.3.59.4.1-1, 7.3.59.5-1, 7.3.59.5-2 and 7.3.59.5-3.

7.3.59.4 Test description

There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.59.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

UE shall successfully complete the RRC reconfiguration accordingly prior to the start of time duration T1.

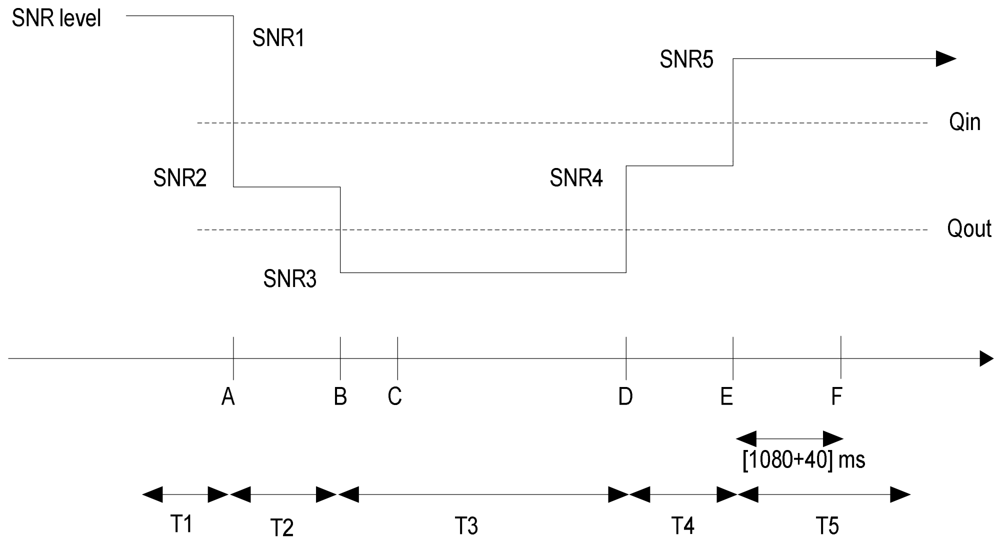

Figure 7.3.59.4-1: SNR variation for in-sync testing in DRX

7.3.59.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.

2. The general test parameter settings for the different subtests are set up according to Table 7.3.59.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0

4. Message contents are defined in clause 7.3.59.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.59.4.1-1: General test parameters for E-UTRAN TDD In-sync tests in DRX for UE category M1 configured in CEMode A

Parameter		Unit	Value	Comment
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	In sync threshold $Q_{in, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	8	
	MPDCCH repetition level		4	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		6-1A	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		2	Out of sync threshold $Q_{out, Cat M1}$ and the corresponding hypothetical MPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively.
	MPDCCH aggregation level	eCCE	24	
	MPDCCH repetition level		8	
	ρ_A, ρ_B		-3	
	Ratio of MPDCCH to RS EPRE	dB	0	
DRX cycle		ms	40	See Table A.7.3.59.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: MPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.59.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms without repetition. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode MPDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

1. Ensure the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3.

2. SS sends a RRC Reconfiguration message configuring M-PDCCH aggregation level and M-PDCCH repetition level as defined in Table 7.3.59.4.1-1

3. Set the parameters according to T1 in Table 7.3.59.5-1. Propagation conditions are set according to Annex B.1. T1 starts.

4. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.59.5-1. T2 starts.

5. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.59.5-1. T3 starts.

6. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.59.5-1. T4 starts.

7. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.59.5-1. T5 starts.

8. If the SS detects uplink power equal to or higher than [-39 dBm] (as defined in TS 36.521-1 clause 6.3.2.5 for carrier frequency less than [3]GHz) in each subframe configured for CQI transmission (according CQI reporting mode PUCCH 1-0) during the period from time point A to time point F (1120 ms after the start of time duration T5) the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.

9. After T5 expires, repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.59.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.59.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.4-2
Default RRC messages and information elements contents exceptions	

Table 7.3.59.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULTT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig- DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213 [8])	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	OFF	(see Table 7.2.2-1B and clause 7.2.2 in TS 36.213 [8])	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.59.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf10		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		Sf1280 typical value in real network for real-time services.	
Sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		
}			

Table 7.3.59.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated	Not present		RBC
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		RBC
}			

Table 7.3.59.4.3-5: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX in UE category M1 configured in CEMode A

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		
}			
}			

Table 7.3.59.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX for UE category M1 with CE mode A

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.59.5 Test requirement

Table 7.3.59.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring tests in DRX for UE category M1 configured in CEMode A

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Special subframe configuration		6				
Uplink-downlink configuration		1				
MPDCCH parameters defined in A.7.3		R.15 TDD				
OCNG Pattern defined in D.2.11 (TDD)		OP.11 TDD				
ρ_A, ρ_B		-3				
MPDCCH_RA	dB	0				
MPDCCH_RB	dB	0				
PBCH_RA	dB	-3				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	-98				
SNR Note 8	dB	[-5.13]	[-10.13]	[-18.13]	[-11.13]	[-5.13]
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				
Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains MPDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.59.4.1-1.						

Table 7.3.59.5-2: DRX-Configuration for E-UTRAN TDD out-of-sync tests for UE category M1 configured in CEMode A

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.59.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD out-of-sync testing for UE category M1 configured in CEMode A

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Editor's note: This Test case is incomplete

- The Test system uncertainties are undefined
- The Test Tolerances and Test Requirements applicable are undefined
- The Message Content is TBD
- Test requirements defined by RAN4 mentions time period T4 but that is not defined in the figure
- Connection diagram is FFS
- Some minimum requirements are within brackets, Table 7.3.60.3-2
- Test parameter table for the eCell is missing in TS36.133
- The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508
- The NB-IoT carrier allocation is not defined in TS36.133 (for other test cases it is PRB30)

7.3.60.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT HD-FDD radio link monitoring requirements in clause TS36.133 clause 7.23.

7.3.60.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of category NB-1.

7.3.60.3 Minimum conformance requirements

The requirements defined in this subclause for performing radio link monitoring are applicable for Category NB1 UE defined in Section 3.1 of TS36.133.

The UE shall meet all applicable requirements specified in this clause under the following condition:

- at least 1 DL subframe per radio frame of serving NB-IoT cell is available at the UE during Q_{out_NB-IoT} and Q_{in_NB-IoT} evaluation periods.

The UE shall estimate the downlink radio link quality and compare it to the thresholds Q_{out_NB-IoT} and Q_{in_NB-IoT} for the purpose of monitoring downlink radio link quality of the NB-IoT cell.

The threshold Q_{out_NB-IoT} is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.60.3-1.

The threshold Q_{in_NB-IoT} is defined as the level at which the downlink radio link quality can be significantly more reliably received than at Q_{out_NB-IoT} and shall correspond to 2% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.60.3-1.

Table 7.3.60.3-1: NPDCCH transmission parameters for out-of-sync and in-sync for Category NB1 UE

Attribute	Out-of-sync	In-sync
DCI format	Format N1	Format N1
Number of information bits	22 bits	22 bits
System Bandwidth	200kHz	200kHz
Antenna configuration	2x1	2x1
Maximum NPDCCH Repetition level	R_{max} Note1	$R_{max}/4$ Note1
Aggregation level	2	2
DRX	OFF	OFF
Deployment mode	In-band	In-band
NOTE 1: R_{max} is a configurable parameter defined in TS 36.331[5].		

When DRX is used for HD-FDD Category NB1 UE UEs, the Q_{out_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$) and the Q_{in_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$) is specified in Table 7.3.60.3-2 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] period becomes worse than the threshold Q_{out_NB-IoT}, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] period becomes better than the threshold Q_{in_NB-IoT}, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in TS36.213[8], clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least max([10]ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within [40] ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.60.3-2: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX\_NB-IoT}$ and $T_{Evaluate\_Qin\_DRX\_NB-IoT}$ (s)	
	DRX cycles for R_{max}<=[TBD]	DRX cycles for R_{max}>[TBD]
0.256 < DRX cycle ≤ [1.024]	Note 1 ([20])	Note 1 ([40])
[1.024] < DRX cycle ≤ [3.072]	Note 1 ([10])	Note 1 ([20])
[4.096] < DRX cycle ≤ 9.216	Note 1 ([5])	Note 1 ([10])
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.60.

7.3.60.4 Test description

The test consists of one subtest with one NB-IOT cell (Ncell 1) and one EUTRAN cell (cell 1) configured. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.1.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync state with the following testing procedure:

- Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell1
- Starting at point A, the SNR is decreased in small steps from SNR1 to SNR2 within dT
- At the start of the time duration T2, the UE is provided with a UL grant with NPDCCH

NOTE 1: The UE is expected to decode the NPDCCH and complete the UL transmission during T2 according to the UL grant.

- Starting at point B, the SNR is decreased in small steps from SNR2 to SNR3 within dT
- During T3, the SNR is kept as SNR3

NOTE 2: The UE is expected to detect OOS and declare RLF during T3.

- Starting at point C, the SNR is increased in small steps from SNR3 to SNR1 with dT
- At the start of the time period T4, the UE will be provided with another UL grant with NPDCCH

NOTE 3: The UE is not expected to decode the UL grant and conduct any UL transmission during T4, since the UE is expected to declare RLF during T3.

In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode the NPDCCH and complete the UL transmission when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

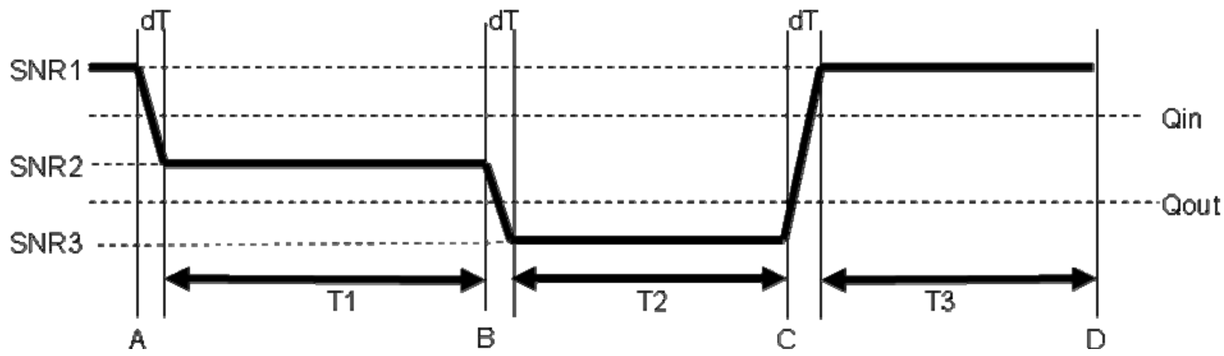

Figure 7.3.60.4-1: SNR variation for out-of-sync testing in DRX for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under normal coverage

7.3.60.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table [E-1] and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 7.3.60.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.60.4.3
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.60.4.1-1: General test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	Value	Comment
Active cell		Ncell 1	
EUTRAN cell		Cell 1	
CP length		Normal	
Deployment Mode		In-band	
NPDCCH transmission parameters R_{max}		8	Other NPDCCH parameters are defined in " out-of-sync" column in Table 7.3.60.3-1
DRX cycle	ms	256	See Table 7.3.60.5-2
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	100	T311 is enabled
T1	s	5.12	
T2	s	10.24	
T3	s	5.12	
dT	ms	1000	
Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: N310, N311, T310 and T311 are defined in TS 36.331[5]. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.			

7.3.60.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.60.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. When T1 expires, the 1st time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.60.5-1 for T2, with SNR level changing by [1] dB in [0.1] second.
4. When dT expires the SS shall change the SNR value to T2 (SNR2) as specified in Table 7.3.60.5-1. T2 starts.
5. At the start of T2 the UE shall be provided with a UL grant on NPDCCH. The UE shall decode NPDCCH and complete the UL transmission, according to the UL grant, before T2 expires. If the UL transmission is not completed the number of failed test is increased by one, if so restart test from step 1.
6. When T2 expires, the time 2nd window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.60.5-1 for T3, with SNR level changing by [1] dB in [0.1] second.
7. When dT expires the SS shall change the SNR value to T3 (SNR3) as specified in Table 7.3.60.5-1. T3 starts.
8. During T3 the UE is expected to detect OOS and declare RLM. T4 starts.
9. At the start of T4 the UE shall be provided with another UL grant on NPDCCH. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe scheduled to transmit NPUSCH during the period T3 the number of failed tests is increased by one.

   Otherwise the number of successful tests is increased by one.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.60.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

7.3.60.5 Test requirement

Table 7.3.60.5-1: Cell specific test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	Test 1			
		T1	T2	T3	T4
NB-IoT RF Channel Number		1			
LTE Carrier bandwidth	MHz	10			
$BW_{channel}$	KHz	180			
OCNG Pattern as defined in D.3.1 Note 1		NOP.1 FDD			
NPDSCH parameters as defined in A.10.2.1 Note 2		R.14 HD-FDD			
NPDCCH parameters as defined in A.10.1.1 Note 2		R.26 HD-FDD			
NPBCH_RA	dB	0			
NPBCH_RB	dB				
NPSS_RA	dB				
NSSS_RA	dB				
NPDCCH_RA	dB				
NPDCCH_RB	dB				
NPDSCH_RA	dB				
NPDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
SNR Note 4, 5	dB	-3.1+TT	-9.1+TT	-14.1+TT	-3.1+TT
Propagation condition		AWGN			
Correlation Matrix and Antenna Configuration		1x1			

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.
Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2 andT3 are denoted as SNR2, SNR3 and SNR1 respectively in figure 7.3.60.4-1.
Note 6: During dT between the defined Time Intervals, the Test system shall gradually increase or decrease the SNR in steps of [≤1]dB every [0.1] seconds until the target SNR is achieved.

Table 7.3.60.5-2: DRX-Configuration for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.7.3 in TS 36.331
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
drx-StartOffset	0	

Table 7.3.60.5-3: *TimeAlignmentTimer* -Configuration for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Editor's note: This Test case is incomplete

- The Test system uncertainties are undefined
- The Test Tolerances and Test Requirements applicable are undefined
- The Message Content is TBD
- Test requirements defined by RAN4 mentions time period T4 but that is not defined in the figure
- Connection diagram is FFS
- Some minimum requirements are within brackets, Table 7.3.61.3-2
- Test parameter table for the eCell is missing in TS36.133
- The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508
- The NB-IoT carrier allocation is not defined in TS36.133 (for other test cases it is PRB30)

7.3.61.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell. This test will partly verify the NB-IoT HD-FDD radio link monitoring requirements in clause TS36.133 clause 7.23.

7.3.61.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of category NB-1.

7.3.61.3 Minimum conformance requirements

The requirements defined in this subclause for performing radio link monitoring are applicable for Category NB1 UE defined in Section 3.1 of TS36.133.

The UE shall meet all applicable requirements specified in this clause under the following condition:

- at least 1 DL subframe per radio frame of serving NB-IoT cell is available at the UE during $Q_{out\_NB\text{-}IoT}$ and $Q_{in\_NB\text{-}IoT}$ evaluation periods.

The UE shall estimate the downlink radio link quality and compare it to the thresholds $Q_{out\_NB\text{-}IoT}$ and $Q_{in\_NB\text{-}IoT}$ for the purpose of monitoring downlink radio link quality of the NB-IoT cell.

The threshold Q_{out_NB-IoT} is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.61.3-1.

The threshold Q_{in_NB-IoT} is defined as the level at which the downlink radio link quality can be significantly more reliably received than at Q_{out_NB-IoT} and shall correspond to 2% block error rate of a hypothetical NPDCCH transmission with transmission parameters specified in Table 7.3.61.3-1.

Table 7.3.61.3-1: NPDCCH transmission parameters for out-of-sync and in-sync for Category NB1 UE

Attribute	Out-of-sync	In-sync
DCI format	Format N1	Format N1
Number of information bits	22 bits	22 bits
System Bandwidth	200kHz	200kHz
Antenna configuration	2x1	2x1
Maximum NPDCCH Repetition level	R_{max} Note1	$R_{max}/4$ Note1
Aggregation level	2	2
DRX	OFF	OFF
Deployment mode	In-band	In-band
NOTE 1: R_{max} is a configurable parameter defined in TS 36.331[5].		

When DRX is used for HD-FDD Category NB1 UE UEs, the Q_{out_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$) and the Q_{in_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$) is specified in Table 7.3.61.3-2 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] period becomes worse than the threshold Q_{out_NB-IoT}, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] period becomes better than the threshold Q_{in_NB-IoT}, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in TS36.213[8], clause 4.2.1. Two successive indications from Layer 1 shall be separated by at least max([10]ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within [40] ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.61.3-2: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ and $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ (s)	
	DRX cycles for R_{max}<=[TBD]	DRX cycles for R_{max}>[TBD]
0.256 < DRX cycle ≤ [1.024]	Note 1 ([20])	Note 1 ([40])
[1.024] < DRX cycle ≤ [3.072]	Note 1 ([10])	Note 1 ([20])
[4.096] < DRX cycle ≤ 9.216	Note 1 ([5])	Note 1 ([10])
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.61.

7.3.61.4 Test description

The test consists of one subtest with one NB-IOT cell (Ncell 1) and one EUTRAN cell (cell 1) configured. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.1.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync state with the following testing procedure:

- Prior to the start of the time duration T1, the UE shall be fully synchronized to nCell1
- Starting at point A, the SNR is decreased in small steps from SNR1 to SNR2 within dT
- At the start of the time duration T2, the UE is provided with a UL grant with NPDCCH

NOTE 1: The UE is expected to decode the NPDCCH and complete the UL transmission during T2 according to the UL grant.

- Starting at point B, the SNR is decreased in small steps from SNR2 to SNR3 within dT
- During T3, the SNR is kept as SNR3

NOTE 2: The UE is expected to detect OOS and declare RLF during T3.

- Starting at point C, the SNR is increased in small steps from SNR3 to SNR1 with dT
- At the start of the time period T4, the UE will be provided with another UL grant with NPDCCH

NOTE 3: The UE is not expected to decode the UL grant and conduct any UL transmission during T4, since the UE is expected to declare RLF during T3.

In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode the NPDCCH and complete the UL transmission when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

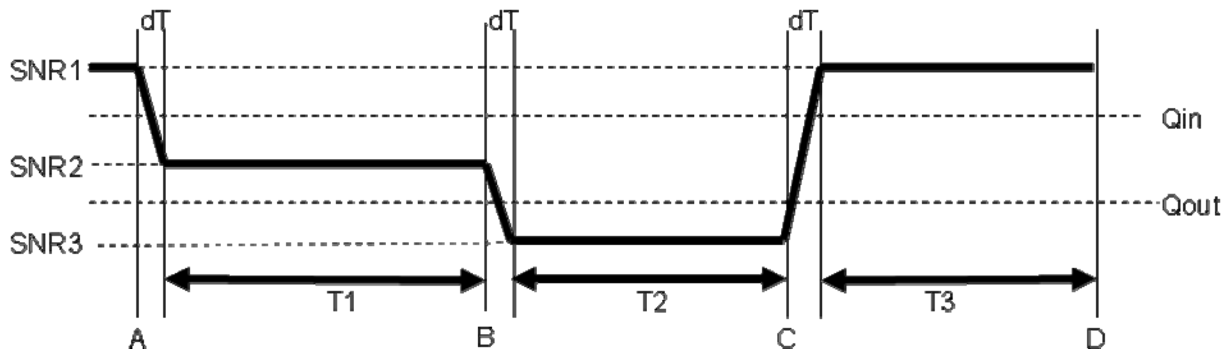

Figure 7.3.61.4-1: SNR variation for out-of-sync testing in DRX for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under normal coverage

7.3.61.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table [E-1] and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 7.3.61.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.61.4.3

5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is a EUTRAN cell.

Table 7.3.61.4.1-1: General test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	Value	Comment
Active cell		Ncell 1	
EUTRAN cell		Cell 1	
CP length		Normal	
Deployment Mode		In-band	
NPDCCH transmission parameters R_{max}		16	Other NPDCCH parameters are defined in “ out-of-sync” column in Table 7.3.61.3-1
DRX cycle	ms	256	See Table 7.3.61.5-2
Layer 3 filtering Note 2,3		Enabled	Counters: N310 = 1 N311 = 1
T310 timer Note 2,3	ms	0	T310 is disabled
T311 timer Note 2,3	ms	100	T311 is enabled
T1	s	5.12	
T2	s	10.24	
T3	s	5.12	
dT	ms	1000	
Note 1: NPDCCH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel. Note 2: N310, N311, T310 and T311 are defined in TS 36.331[5]. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.			

7.3.61.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.61.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. When T1 expires, the 1st time window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.61.5-1 for T2, with SNR level changing by [1] dB in [0.1] second.
4. When dT expires the SS shall change the SNR value to T2 (SNR2) as specified in Table 7.3.61.5-1. T2 starts.
5. At the start of T2 the UE shall be provided with a UL grant on NPDCCH. The UE shall decode NPDCCH and complete the UL transmission, according to the UL grant, before T2 expires. If the UL transmission is not completed the number of failed test is increased by one, if so restart test from step 1.
6. When T2 expires, the time 2nd window dT starts. During dT the SS shall change the SNR towards the SNR value as specified in Table 7.3.61.5-1 for T3, with SNR level changing by [1] dB in [0.1] second.
7. When dT expires the SS shall change the SNR value to T3 (SNR3) as specified in Table 7.3.61.5-1. T3 starts.
8. During T3 the UE is expected to detect OOS and declare RLM. T4 starts.
9. At the start of T4 the UE shall be provided with another UL grant on NPDCCH. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe scheduled to transmit NPUSCH during the period T3 the number of failed tests is increased by one.

   Otherwise the number of successful tests is increased by one.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.61.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

7.3.61.5 Test requirement

Table 7.3.61.5-1: Cell specific test parameters for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Parameter	Unit	Test 1			
		T1	T2	T3	T4
NB-IoT RF Channel Number		1			
LTE Carrier bandwidth	MHz	10			
$BW_{channel}$	KHz	180			
OCNG Pattern as defined in D.3.1 Note 1		NOP.1 FDD			
NPDSCH parameters as defined in A.10.2.1 Note 2		R.14 HD-FDD			
NPDCCH parameters as defined in A.10.1.1 Note 2		R.26 HD-FDD			
NPBCH_RA	dB	-3			
NPBCH_RB	dB				
NPSS_RA	dB				
NSSS_RA	dB				
NPDCCH_RA	dB				
NPDCCH_RB	dB				
NPDSCH_RA	dB				
NPDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
SNR Note 4, 5	dB	-6.3+TT	-11.4+TT	-17.4+TT	-6.3+TT
Propagation condition		AWGN			
Correlation Matrix and Antenna Configuration		2x1			

Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.
Note 2: The NPDSCH and NPDCCH reference measurement channels are used in the test only when a downlink transmission dedicated to the UE under test is required.
Note 3: Es/Iot, NRSRP and Io level has been derived from other parameters for information purpose. They are not settable parameters themselves.
Note 4: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 5: The SNRs in time periods T1, T2 andT3 are denoted as SNR2, SNR3 and SNR1 respectively in figure 7.3.61.4-1.
Note 6: During dT between the defined Time Intervals, the Test system shall gradually increase or decrease the SNR in steps of [≤1]dB every [0.1] seconds until the target SNR is achieved.

Table 7.3.61.5-2: DRX-Configuration for HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage

Field	Value	Comment
onDurationTimer	pp1	As specified in clause 6.7.3 in TS 36.331
drx-InactivityTimer	pp0	
drx-RetransmissionTimer	pp0	
drx-StartOffset	0	

Table 7.3.61.5-3: *TimeAlignmentTimer* -Configuration for NB-IoT HD-FDD out-of-sync testing for UE category NB1 configured under normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331

The UE behaviours in each test shall be as follows:

- The UE shall complete the NPUSCH transmission during T2 according to the received UL grant;
- The UE shall not conduct any NPUSCH transmission during T4.

A correct event is defined as UE behaves correctly in all above steps. The correct events observed during repeated tests shall be at least 90%.

7.3.62 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Enhanced Coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex E needs to be updated
- Message contents need to be updated.
- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Some minimum requirement parameter values are within brackets.
- The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508.

7.3.62.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE configured in enhanced coverage properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell when DRX is used. This test will partly verify the HD-FDD radio link monitoring requirements in TS 36.133 clause 7.23.

7.3.62.2 Test applicability

This test case applies to all types of UE release 13 and forward of category NB1.

7.3.62.3 Minimum conformance requirements

When DRX is used for HD-FDD Category NB1 UEs, the Q_{out_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$) and the Q_{in_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$) is specified in Table 7.3.62.3-1 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] period becomes worse than the threshold Q_{out_NB-IoT}, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] period becomes better than the threshold Q_{in_NB-IoT}, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.62.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX\_NB-IoT}$ and $T_{Evaluate\_Qin\_DRX\_NB-IoT}$ (s)	
	DRX cycles for $R_{max} \leq 64$	DRX cycles for $R_{max} > 64$
0.256 < DRX cycle ≤ 1.024	Note 1 (20)	Note 1 (40)
1.024 < DRX cycle ≤ 3.072	Note 1 (10)	Note 1 (20)
4.096 < DRX cycle ≤ 9.216	Note 1 (5)	Note 1 (10)
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23.2 and A.7.3.62.

7.3.62.4 Test description

There is one NB-IoT cell (Ncell 1), which is the active cell, and an E-UTRA cell (Cell 1), in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.62.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2 and T3 are as follows:

- During the period from time point A to time point B, the SNR is decreasing linearly from SNR1 to SNR2.
- During the period from time point C to time point D, the SNR is increasing linearly from SNR2 to SNR1.
- During the period T3, the test system shall send the UE a grant to transmit in uplink. UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission.
- Thereafter UE switches back to downlink.

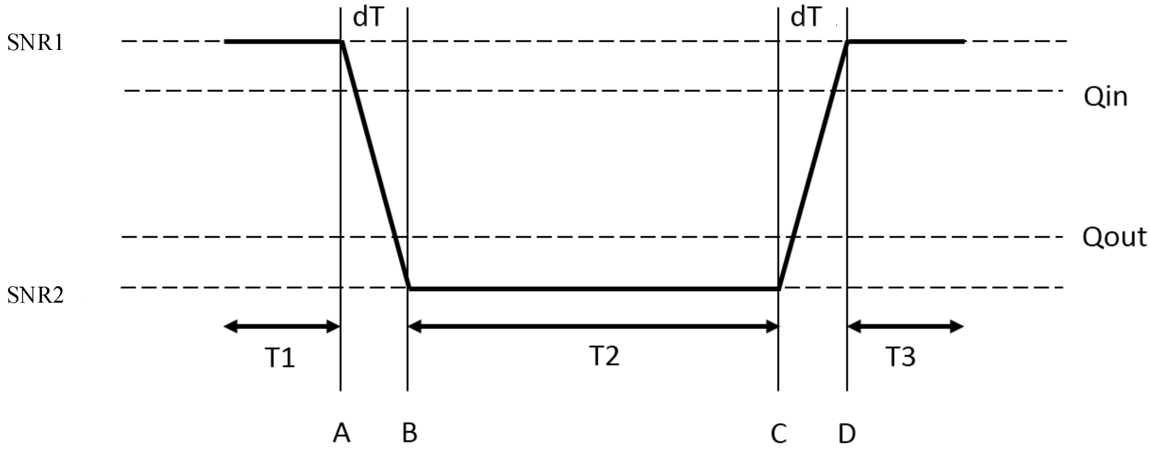

Figure 7.3.62.4-1: SNR variation for in-sync testing with DRX

7.3.62.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table [E-1] and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: 200kHz as defined in TS 36.508 [7] clause 8.1.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.3 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 7.3.62.4.1-1.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.62.4.3.
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is an E-UTRA cell.

Table 7.3.62.4.1-1: General test parameters for HD-FDD in-sync test with DRX for UE category NB1 in enhanced coverage

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Value</th><th>Comment</th></tr>
<tr><td colspan="2">NB-IoT operational mode</td><td></td><td>In-band</td><td></td></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Ncell 1</td><td>NB-IOT cell Ncell1 is within E-UTRA cell Cell1</td></tr>
<tr><td colspan="2">E-UTRA cell</td><td></td><td>Cell1</td><td></td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td></td></tr>
<tr><td rowspan="6">In sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>Format N1</td><td>As defined in TS 36.212</td></tr>
<tr><td>Number of OFDM symbols for legacy control channels</td><td></td><td>3</td><td rowspan="5">In sync threshold Q_{in_NB-IoT} and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.23.2 and Table 7.23.2-1 respectively.</td></tr>
<tr><td>NPDCCH aggregation level</td><td>eCCE</td><td>2</td></tr>
<tr><td>NPDCCH repetition level</td><td></td><td>4</td></tr>
<tr><td>Ratio of NPDSCH to NRS EPRE</td><td></td><td>0</td></tr>
<tr><td>Ratio of NPDCCH to NRS EPRE</td><td></td><td>0</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>Format N1</td><td>As defined in TS 36.212</td></tr>
<tr><td>Number of OFDM symbols for legacy control channels</td><td></td><td>3</td><td rowspan="5">Out of sync threshold Q_{out_NB-IoT} and the corresponding hypothetical NPDCCH transmission parameters are as specified in TS 36.133[4] clause 7.23.2 and Table 7.23.2-1 respectively.</td></tr>
<tr><td>NPDCCH aggregation level</td><td>eCCE</td><td>2</td></tr>
<tr><td>NPDCCH repetition level</td><td></td><td>16</td></tr>
<tr><td>Ratio of NPDSCH to NRS EPRE</td><td></td><td>0</td></tr>
<tr><td>Ratio of NPDCCH to RS EPRE</td><td>dB</td><td>0</td></tr>
<tr><td colspan="2">DRX cycle</td><td>ms</td><td>256</td><td>See Table 7.3.62.5-3</td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>2000</td><td>T310 is enabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>4</td><td></td></tr>
<tr><td colspan="2">dT</td><td>s</td><td>2</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>13</td><td></td></tr>
<tr><td colspan="2">dT</td><td>s</td><td>2</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>4</td><td></td></tr>
<tr><td colspan="5">Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.62.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.

2. Set the parameters according to T1 in Table 7.3.62.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.

3. When T1 expires, the SS shall change the SNR to a value as specified in Table 7.3.62.5-1 corresponding to first dT, with SNR level changing by 1 dB in 0.1 second. First dT starts.

4. When dT expires the SS shall change the SNR value to T2 as specified in Table 7.3.62.5-1. T2 starts.

5. When T2 expires, the SS shall change the SNR to a value as specified in Table 7.3.62.5-1 corresponding to second dT, with SNR level changing by 1 dB in 0.1 second. Second dT starts.

6. When dT expires the SS shall change the SNR value to T3 as specified in Table 7.3.62.5-1. T3 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe scheduled to transmit NPUSCH during the period T3 the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.62.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 7.3.62.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Enhanced coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table [FFS]
Default RRC messages and information elements contents exceptions	

7.3.62.5 Test requirement

Table 7.3.62.5-1: Ncell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 in enhanced coverage

Parameter	Unit	Ncell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	180				
PRB location within E-UTRA Cell	-	30				
NPDCCH parameters defined in [FFS]		R.27 HD-FDD				
Ratio of NPDSCH to NRS EPRE		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.62.5-2				
SNR Note 5, Note 6	dB	[-6.3]+TT	Note 7	[-17.4]+TT	Note 8	[-6.3]+TT
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in E-UTRA Cell 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.62.4.1-1.
Note 7: The Test system shall gradually reduces it's transmit power in steps of 1 dB every 0.1 s until SNR2 can be ensured at the end of the first dT.
Note 8: The Test system shall gradually increase it's transmit power in steps of 1 dB every 0.1 second till SNR1 can be ensured at the end of the second dT.

Table 7.3.62.5-2: Cell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 in enhanced coverage

		Cell 1
		T1-T3
$BW_{channel}$	MHz	10
NOCNG Pattern	-	NOP.1 FDD
PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note2	dBm/15 kHz	-98
$\hat{E}_s/N_{oc}$	dB	-12
Propagation Condition		AWGN
Antenna Configuration		1x1
Note 1: OCNG shall be used such that the E-UTRA Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

Table 7.3.62.5-3: DRX-Configuration for E-UTRAN HD-FDD out-of-sync tests for UE category NB1 configured in enhanced coverage

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 7.3.62.5-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for UE category NB1 configured in enhanced coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test shall be as follows:

During the period T3, the UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. This is considered a correct event.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2F.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.63 HD-FDD Radio Link Monitoring Test for In-sync with DRX for Category NB1 In-Band mode in Normal Coverage

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex E needs to be updated

- Message contents need to be updated.

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Some minimum requirement parameter values are within brackets.

- The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508.

7.3.63.1 Test purpose

The purpose of this test is to verify that the HD-FDD category NB1 UE configured in normal coverage properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the NB-IoT Cell when DRX is used. This test will partly verify the HD-FDD radio link monitoring requirements in TS 36.133 clause 7.23.

7.3.63.2 Test applicability

This test case applies to all types of UE release 13 and forward of category NB1.

7.3.63.3 Minimum conformance requirements

When DRX is used for HD-FDD Category NB1 UEs, the Q_{out_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$) and the Q_{in_NB-IoT} evaluation period ($T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$) is specified in Table 7.3.63.3-1 will be used.

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] period becomes worse than the threshold Q_{out_NB-IoT}, Layer 1 of the UE shall send out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{out\_DRX\_NB-IoT}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] period becomes better than the threshold Q_{in_NB-IoT}, Layer 1 of the UE shall send in-sync indications for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{in\_DRX\_NB-IoT}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10ms, DRX_cycle_length).

Upon start of T310 timer as specified in clause 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [5].

Table 7.3.63.3-1: Q_{out} and Q_{in} Evaluation Period in DRX for HD-FDD Category NB1 UE

DRX cycle length (s)	$T_{Evaluate\_Qout\_DRX\_NB-IoT}$ and $T_{Evaluate\_Qin\_DRX\_NB-IoT}$ (s)	
	DRX cycles for R_{max} ≤ 64	DRX cycles for R_{max} > 64
0.256 < DRX cycle ≤ 1.024	Note 1 (20)	Note 1 (40)
1.024 < DRX cycle ≤ 3.072	Note 1 (10)	Note 1 (20)
4.096 < DRX cycle ≤ 9.216	Note 1 (5)	Note 1 (10)
NOTE 1: Evaluation period length in time depends on the length of the DRX cycle in use		

The normative reference for this requirement is TS 36.133 [4] clause 7.23.2 and A.7.3.63.

7.3.63.4 Test description

There is one NB-IoT cell (Ncell 1), which is the active cell, and an E-UTRA cell (Cell 1), in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively, excluding the transition time duration dT, where the SNR increases or decreases gradually in small steps. Figure 7.3.63.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

The test setup in each test during time durations T1, T2 and T3 are as follows:

- During the period from time point A to time point B, the SNR is decreasing linearly from SNR1 to SNR2.
- During the period from time point C to time point D, the SNR is increasing linearly from SNR2 to SNR1.
- During the period T3, the test system shall send the UE a grant to transmit in uplink. UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission.

Thereafter UE switches back to downlink.

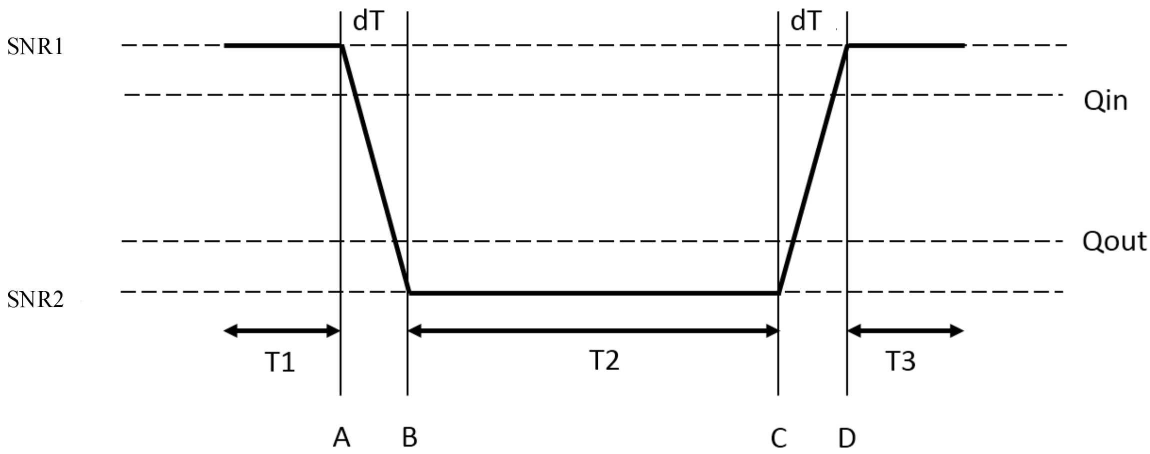

Figure 7.3.63.4-1: SNR variation for in-sync testing with DRX

7.3.63.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 8.1.1.

Frequencies to be tested: According to Annex E table [E-1] and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: 200kHz as defined in TS 36.508 [7] clause 8.1.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.3 using only main Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 7.3.63.4.1-1.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.63.4.3.
5. There are two cells specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 1 is an E-UTRA cell.

Table 7.3.63.4.1-1: General test parameters for HD-FDD in-sync test with DRX for UE category NB1 in normal coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			Ncell 1	NB-IOT cell Ncell1 is within E-UTRA cell Cell1
E-UTRA cell			Cell1	
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	In sync threshold Q_{in_NB-IoT} and the corresponding hypothetical NPDCCH transmission parameters are as specified in TS 36.133[4] clause 7.23.2 and Table 7.23.2-1 respectively.
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		2	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold Q_{out_NB-IoT} and the corresponding hypothetical NPDCCH transmission parameters are as specified in TS 36.133[4] clause 7.23.2 and Table 7.23.2-1 respectively.
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		8	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
DRX cycle		ms	256	See Table 7.3.63.5-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	4	
dT		s	2	
T2		s	13	
dT		s	2	
T3		s	4	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.63.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully be synchronized to Ncell 1. The UE is scheduled in every possible uplink subframe to transmit NPUSCH, which is received by the test equipment.

1. Ensure the UE is in State 2A-NB according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.63.5-1. Propagation conditions are set according to Annex B clause B.2. T1 starts.
3. When T1 expires, the SS shall change the SNR to a value as specified in Table 7.3.63.5-1 corresponding to first dT, with SNR level changing by 1 dB in 0.1 second. First dT starts.
4. When dT expires the SS shall change the SNR value to T2 as specified in Table 7.3.63.5-1. T2 starts.
5. When T2 expires, the SS shall change the SNR to a value as specified in Table 7.3.63.5-1 corresponding to second dT, with SNR level changing by 1 dB in 0.1 second. Second dT starts.
6. When dT expires the SS shall change the SNR value to T3 as specified in Table 7.3.63.5-1. T3 starts.
7. If the SS detects uplink power equal to or higher than -39 dBm in the On-duration part of every DRX cycle in the uplink subframe scheduled to transmit NPUSCH during the period T3 the number of successful tests is increased by one.

   Otherwise the number of failed tests is increased by one.
8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.63.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 7.3.63.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Normal Coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table [FFS]
Default RRC messages and information elements contents exceptions	

7.3.63.5 Test requirement

Table 7.3.63.5-1: Ncell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 in normal coverage

Parameter	Unit	Ncell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	180				
PRB location within E-UTRA Cell	-	30				
NPDCCH parameters defined in [FFS]		R.27 HD-FDD				
Ratio of NPDSCH to NRS EPRE		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.63.5-2				
SNR Note 5, Note 6	dB	[-3.1]+TT	Note 7	[-14.1]+TT	Note 8	[-3.1] +TT
Propagation condition		AWGN				
Correlation Matrix and Antenna Configuration		2x1				
Note 1: OCNG shall be used such that the resources in Ncell1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.63.4.1-1. Note 7: The Test system shall gradually reduce it's transmit power in steps of 1 dB every 0.1 second till SNR2 can be ensured at the end of the first dT. Note 8: The Test system shall gradually increase it's transmit power in steps of 1 dB every 0.1 second till SNR1 can be ensured at the end of the second dT.						

Table 7.3.63.5-2: Cell 1 specific test parameters for HD-FDD in-sync radio link monitoring test with DRX for UE category NB1 in normal coverage

		Cell 1
		T1-T3
$BW_{channel}$	MHz	10
NOCNG Pattern	-	NOP.1 FDD
PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s/N_{oc}$	dB	4
Propagation Condition		AWGN
Antenna Configuration		1x1
Note 1: OCNG shall be used such that the E-UTRA Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

Table 7.3.63.5-3: DRX-Configuration for E-UTRAN HD-FDD out-of-sync tests for UE category NB1 configured in normal coverage

Field	Value	Comment
onDurationTimer	psf10	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 7.3.63.5-4: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for UE category NB1 configured in normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section 10.1 in TS 36.213.

The UE behaviour in each test shall be as follows:

During the period T3, the UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. This is considered a correct event.

The uplink signal is verified on the basis of the UE output power:

- UE output power equal to or higher than Transmit minimum power -39 dBm (as defined in TS 36.521-1 [10] clause 6.3.2F.5) means uplink signal.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.64 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage

Editor's note: This test case is not complete. Following aspects are either missing or not yet determined:

- Test system uncertainties and test tolerances is TBD
- Message contents are FFS
- Test Requirements are TBD
- The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508

7.3.64.1 Test Purpose

The purpose of this test is to verify that the HD-FDD category NB UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when the UE is under normal coverage conditions. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.23.

7.3.64.2 Test Applicability

This test case applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE Category NB1.

7.3.64.3 Minimum Conformance Requirements

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{out\_NB\text{-}IoT}$ period becomes worse than the threshold $Q_{out\_NB\text{-}IoT}$, Layer 1 of the UE shall send an out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{out\_NB\text{-}IoT}$ $Q_{out\_NB\text{-}IoT}$ evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{in\_NB\text{-}IoT}$ period becomes better than the threshold $Q_{in\_NB\text{-}IoT}$, Layer 1 of the UE shall send an in-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{in\_NB\text{-}IoT}$ $Q_{in\_NB\text{-}IoT}$ evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least [10]ms.

The transmitter power of the UE shall be turned off within [40] ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2]. The following table 7.3.64.3-1 defines the $T_{Evaluate\_}Q_{out\_NB\text{-}IoT}$ and $T_{Evaluate\_}Q_{in\_NB\text{-}IoT}$ for each coverage mode.

Table 7.3.64.3-1: Mapping of coverage mode and Q_{out} and Q_{in} Evaluation Period in non-DRX for HD-FDD Category NB1 UE

Coverage Mode	$T_{Evaluate\_}Q_{out\_NB\text{-}IoT}$	$T_{Evaluate\_}Q_{in\_NB\text{-}IoT}$
Normal	[400]ms	[200]ms
Enhanced	[4000]ms	[2000]ms

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.64.

7.3.64.4 Test description

There is one cell (nCell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, dT, T2, dT and T3 respectively. Figure 7.3.EE.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every uplink subframe to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is disabled, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

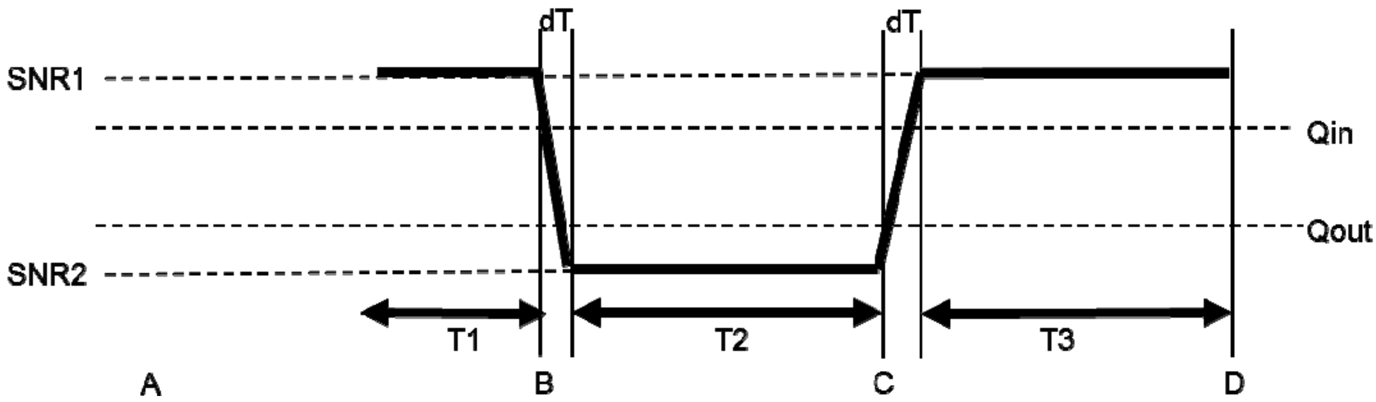

Figure 7.3.64.4-1: SNR variation for in-sync testing without DRX

7.3.64.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table [E-1] and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: 200 kHz as defined in TS 36.508 [7] clause 8.1.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.64.4.1-1 and 7.3.64.4.1-2.
3. Propagation conditions are set according to Annex B clause B.2.
4. Message contents are defined in clause 7.3.64.4.3.
5. There is one NB1 cell and one EUTRA Cell specified in this test. nCell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.64.4.1-1: General test parameters for HD-FDD in-sync test without DRX for UE category NB1 in normal coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			Ncell 1	NB-IOT cell Ncell1 is within E-UTRA cell Cell1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212[21]
	Number of OFDM symbols for legacy control channels		3	In sync threshold $Q_{in, Cat NB1}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4].
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		16	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212[21]
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold $Q_{out, Cat NB1}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively in TS 36.133[4].
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		64	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	[4]	
dT		s	[2]	
T2		s	[13]	
dT		s	[2]	
T3		s	[4]	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

Table 7.3.64.4.1-2: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for UE category NB1 configured in normal coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section 10.1 in TS 36.213 [8].

7.3.64.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE shall be configured for NPUSCH transmission for every possible uplink sub-frame.

1. Ensure the UE is in State 2A-NB with CP CIoT optimisation according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.EE.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.64.5-1 in dT s with SNR level changing by FFS dB in FFS S. T2 starts.
4. When T2 expires the SS shall increase the SNR value to T3 as specified in Table 7.3.64.5-1 in dT s with SNR level changing by FFS dB in FFS s. T3 starts.
5. During T3 SS sends continuous uplink grants and if the SS detects uplink transmission equal to or higher than -FFS in each uplink subframe configured for NPUSCH during the period from time point C+dT to time point D (FFS ms after the start of time duration T3) the number of successful tests is increased by one.
6. Otherwise the number of failed tests is increased by one.
7. After T3 expires, repeat steps 2-6 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved

7.3.64.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and FFS:

7.3.64.5 Test requirement

Table 7.3.EE.5.1-1: nCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 in normal coverage

Parameter	Unit	Ncell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	200				
PRB location within eCell	-	30				
NPDCCH parameters defined in A.3.1.3		R.26 HD-FDD				
OCNG Pattern defined in A.3.2.3		NOP.1 FDD				
NPDSCH_RA		-3				
NPDSCH_RB		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.64.5.1-2				
SNR Note 5, Note 6	dB	[6]+TT	Note 7	[-15]+TT	Note 8	[6] +TT
Propagation condition		EPA5Hz				
Correlation Matrix and Antenna Configuration		2x1				

Note 1: OCNG shall be used such that the resources in ncell1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, dT, T2, dT and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.EE.4-1.
Note 7: The Test system shall gradually reduce its transmit power in steps of [≤1]dB every [0.1] seconds till SNR2 can be ensured at the end of dT.
Note 8: The Test system shall gradually increase its transmit power in steps of [≤1]dB every [0.1] seconds till SNR1 can be ensured at the end of dT.

Table 7.3.64.5.1-2: eCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 in normal coverage

		Cell 1
		T1-T3
$BW_{channel}$	MHz	10
PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s/N_{oc}$	dB	6 +TT
Propagation Condition		EPA5Hz
Antenna Configuration		2x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

During the period from time point C+dT to time point D, the UE behaviours in each test shall be as follows:

UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. Thereafter UE switches back to downlink. This is considered a correct event.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.65 HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced Coverage

Editor's note: This test case is not complete. Following aspects are either missing or not yet determined:

- Test system uncertainties and test tolerances is TBD
- Message contents are FFS
- Test Requirements are TBD
- The NB-IoT test frequency in PRB30 in 10MHz LTE cell is missing in TS36.508

7.3.65.1 Test Purpose

The purpose of this test is to verify that the HD-FDD category NB UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the PCell when the UE is under normal coverage conditions. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 [4] section 7.23.

7.3.65.2 Test Applicability

This test case applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE Category NB1.

7.3.65.3 Minimum Conformance Requirements

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_Qout\_NB-IoT}$ period becomes worse than the threshold Q_{out_NB-IoT}, Layer 1 of the UE shall send an out-of-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{out\_NB-IoT}$ Q_{out_NB-IoT} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [2].

When the downlink radio link quality of the NB-IoT cell estimated over the last $T_{Evaluate\_}Q_{in\_NB-IoT}$ period becomes better than the threshold Q_{in_NB-IoT}, Layer 1 of the UE shall send an in-sync indication for the NB-IoT cell to the higher layers within $T_{Evaluate\_}Q_{in\_NB-IoT}$ Q_{in_NB-IoT} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [2].

The out-of-sync and in-sync evaluations of the NB-IoT cell shall be performed as specified in clause 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least [10]ms.

The transmitter power of the UE shall be turned off within [40] ms after expiry of T310 timer as specified in clause 5.3.11 in TS 36.331 [2]. The following table 7.3.65.3-1 defines the $T_{Evaluate\_}Q_{out\_NB-IoT}$ and $T_{Evaluate\_}Q_{in\_NB-IoT}$ for each coverage mode.

Table 7.3.65.3-1: Mapping of coverage mode and Q_{out} and Q_{in} Evaluation Period in non-DRX for HD-FDD Category NB1 UE

Coverage Mode	$T_{Evaluate\_}Q_{out\_NB-IoT}$	$T_{Evaluate\_}Q_{in\_NB-IoT}$
Normal	[400]ms	[200]ms
Enhanced	[4000]ms	[2000]ms

The normative reference for this requirement is TS 36.133 [4] clause 7.23 and A.7.3.65.

7.3.65.4 Test description

There is one cell (Ncell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, dT, T2, dT and T3 respectively. Figure 7.3.GG.4-1 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE is scheduled in every uplink subframe to transmit NPUSCH, which is received by the test equipment. By measuring the reception of the NPUSCH, detection of out of sync and in sync requirements can be measured. In the test, DRX configuration is disabled, i.e. UE tries to decode NPDCCH and to send NPUSCH during the period when On-duration timer is running. Time alignment timers shall be set to “infinity” so that UL timing alignment is maintained during the test.

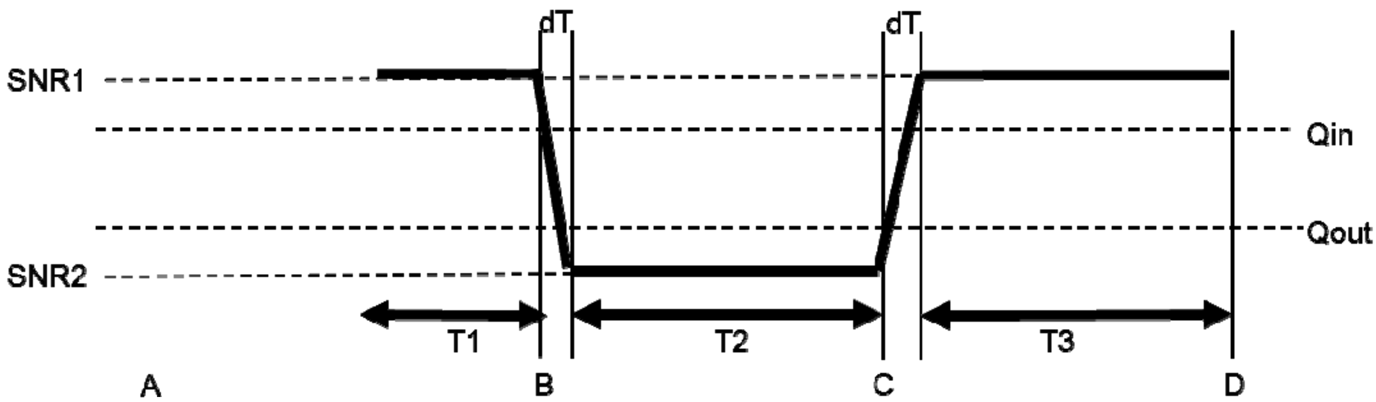

Figure 7.3.GG.4-1: SNR variation for in-sync testing without DRX

7.3.65.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table [E-1] and TS 36.508 [7] clauses 8.1.4.2 and 8.1.3.1.

Channel Bandwidth to be tested: 200kHz as defined in TS 36.508 [7] clause 8.1.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10 using only main Tx/Rx antenna.
2. The general test parameter settings for the different subtests are set up according to Table 7.3.65.4.1-1 and 7.3.65.4.1-2.
3. Propagation conditions are set according to Annex B clause B.2
4. Message contents are defined in clause 7.3.65.4.3
5. There is one NB1 cell and one EUTRA Cell specified in this test. Ncell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.65.4.1-1: General test parameters for HD-FDD in-sync test without DRX for UE category NB1 in enhanced coverage

Parameter		Unit	Value	Comment
NB-IoT operational mode			In-band	
Active cell			Ncell 1	NB-IOT cell Ncell1 is within E-UTRA cell Cell1
CP length			Normal	
In sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212[21]
	Number of OFDM symbols for legacy control channels		3	In sync threshold $Q_{in, Cat NB1}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4]
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		32	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to NRS EPRE		0	
Out of sync transmission parameters (Note 1)	DCI format		Format N1	As defined in TS 36.212[21]
	Number of OFDM symbols for legacy control channels		3	Out of sync threshold $Q_{out, Cat NB1}$ and the corresponding hypothetical NPDCCH transmission parameters are as specified in clause 7.19.2 and Table 7.19.2-1 respectively in TS 36.133 [4]
	NPDCCH aggregation level	eCCE	2	
	NPDCCH repetition level		128	
	Ratio of NPDSCH to NRS EPRE		0	
	Ratio of NPDCCH to RS EPRE	dB	0	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
T1		s	[4]	
dT		s	[2]	
T2		s	[13]	
dT		s	[2]	
T3		s	[4]	
Note 1: NPDCCH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

Table 7.3.GG.4.1-2: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD out-of-sync testing for UE category NB1 configured in enhanced coverage

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section 10.1 in TS 36.213 [8].

7.3.65.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to Ncell 1. The UE shall be configured for NPUSCH transmission for every possible uplink sub-frame.

1. Ensure the UE is in State 2A-NB with CP CIoT optimisation according to TS 36.508 [7] clause 8.1.5.
2. Set the parameters according to T1 in Table 7.3.GG.5-1. Propagation conditions are set according to Annex B clause B.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.65.5-1 in dT s with SNR level changing by FFS dB in FFS S. T2 starts.
4. When T2 expires the SS shall increase the SNR value to T3 as specified in Table 7.3.65.5-1 in dT s with SNR level changing by FFS dB in FFS s. T3 starts.
5. During T3 SS sends continuous uplink grants and if the SS detects uplink transmission equal to or higher than -FFS in each uplink subframe configured for NPUSCH during the period from time point C+dT to time point D (FFS ms after the start of time duration T3) the number of successful tests is increased by one.
6. Otherwise the number of failed tests is increased by one.

8. After T3 expires, repeat steps 2-6 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

7.3.65.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 8.1.6 with the following exceptions:

Table 7.3.65.4.3-1: Common Exception messages for E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced coverage

Default Message Contents	
Common contents of system information blocks exceptions	Table [FFS]
Default RRC messages and information elements contents exceptions	

7.3.65.5 Test requirement

Table 7.3.GG.5.1-1: nCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 in enhanced coverage

Parameter	Unit	Ncell 1				
		T1	dT	T2	dT	T3
$BW_{channel}$	kHz	200				
PRB location within eCell	-	30				
NPDCCH parameters defined in A.3.1.3		R.26 HD-FDD				
OCNG Pattern defined in A.3.2.3		NOP.1 FDD				
NPDSCH_RA		-3				
NPDSCH_RB		-3				
NPDCCH_RA	dB	-3				
NPDCCH_RB	dB	-3				
NPBCH_RA	dB	-3				
NPBCH_RB	dB					
NPSS_RA	dB					
NSSS_RA	dB					
NOCNG_RA Note1	dB					
NOCNG_RB Note1	dB					
N_{oc}	dBm/15 kHz	Specified in Table 7.3.65.5.1-2				
SNR Note 5, Note 6	dB	[0]+TT	Note 7	[-15]+TT	Note 8	[0] +TT
Propagation condition		ETU1Hz				
Correlation Matrix and Antenna Configuration		1x1				
Note 1: OCNG shall be used such that the resources in ncell1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 4: The signal contains NPDCCH for UEs other than the device under test as part of OCNG. Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 6: The SNR in time periods T1, dT, T2, dT and T3 is denoted as SNR1, SNR2, and SNR1 respectively in figure 7.3.GG.4-1. Note 7: The Test system shall gradually reduce its transmit power in steps of [≤1]dB every [0.1] seconds till SNR2 can be ensured at the end of dT. Note 8: The Test system shall gradually increase its transmit power in steps of [≤1]dB every [0.1] seconds till SNR1 can be ensured at the end of dT.						

Table 7.3.65.5.1-2: eCell 1 specific test parameters for HD-FDD in-sync radio link monitoring test without DRX for UE category NB1 in enhanced coverage

Parameter	Unit	Cell 1
		T1-T3
$BW_{channel}$	MHz	10
PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc}	dBm/15 kHz	-98
$\hat{E}_s/N_{oc}$	dB	0 +TT
Propagation Condition		EPA5Hz
Antenna Configuration		1x1
Note 1: OCNG shall be used such that the eCell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power N_{oc}.		

During the period from time point C+dT to time point D, the UE behaviours in each test shall be as follows:

UE under test is expected to decode the uplink grant and switch to uplink and complete the uplink transmission. Thereafter UE switches back to downlink. This is considered a correct event.

The rate of correct events observed during repeated tests shall be at least 90%.

7.4 Void

7.5 Proximity-based Services

7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Call procedure of the test case needs to be tweaked

- Test case applicability is undefined.

- Message contents are TBD.

- Connection diagrams are TBD

- PDSCH scheduling and OCNG configuration during discovery is under investigation.

7.5.1.1 Test purpose

To verify the timing requirements of a UE for ProSe Direct Discovery transmissions when PCell downlink timing is used as a reference.

7.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE FFS.

7.5.1.3 Minimum conformance requirements

The requirements in this subclause are applicable when the reference timing used for ProSe transmissions is the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED). The sidelink transmissions takes place $(N_{\text{TA, SL}} + N_{\text{TA offset}}) \cdot T_{\text{s}}$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell, where $N_{\text{TA offset}}$ is specified in Section 8.1 of [9]. The value of $N_{\text{TA,SL}}$ differs between sidelink channels and signals, and is either $N_{\text{TA, SL}} = N_{\text{TA}}$ or $N_{\text{TA, SL}} = 0$ as specified in Section 9.9 of [9].

The normative reference for this requirement is TS 36.133 [4] clause 7.16.2.1 and A.7.5.1.

Table 7.5.1-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

7.5.1.4 Test description

7.5.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure FFS
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.5.1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting PSDCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode 4 is activated.
2. Set the parameters according to Test 1 in Tables 7.5.1.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall check that the UE transmit timing offset is within the limits specified in Table 7.5.1.5-2 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
4. The SS adjusts the downlink timing for Cell 1 to a delay of +32 × T_S (approximately +1 μs) compared to that in step 3.
5. The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.5.1.5-2. For that purpose, the PSDCH transmission that takes place at least after the first DRX ON duration after downlink timing of Cell 1 is changed is used.

6. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

7.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions FFS.

7.5.1.5 Test requirement

Tables 7.5.1.5-1 defines the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.5.1.5-2, defines the UE uplink timing include Test Tolerances.

Table 7.5.1.5-1: Test parameters for ProSe Transmission Timing Accuracy test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	5	
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table C.3.4.2-1.
ProSe Direct Discovery resource pool configuration		As specified in Table H.6.1.1-1 (Configuration #1)	IE values unless specified otherwise in this test.
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.11 FDD	
OCNG Pattern[Note2]		OP.16 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA[Note3]			
OCNG_RB[Note3]			
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	3.30	
RSRP [Note4]	dBm/15 kHz	-94.7	
SCH_RP [Note 4]	dBm/15 kHz	-94.7	
Propagation condition		AWGN	
Note 1: For the reference measurement channels, see clause A.1. Note 2: For the OCNG pattern, see clause D.1. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

The UE transmit timing offset shall be within the requirements in Table 7.5.1.5-2.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

Table 7.5.1.5-2: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

7.5.2 FFS

7.5.3 E-UTRAN FDD – Interruptions due to ProSe Direct Discovery

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Call procedure of the test case needs to be tweaked
- Test case applicability is undefined.
- Message contents are TBD.
- Connection diagrams are TBD
- Annex E updates are pending.
- PDSCH scheduling and OCNG configuration during discovery is under investigation.

7.5.3.1 Test purpose

To verify that the UE is able to complete PCELL interruption due to ProSe Direct discovery.

7.5.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE FFS.

7.5.3.3 Minimum conformance requirements

For this test, the UE is triggered by the test loop function or the upper layers to monitor ProSe Direct Discovery.

The test parameters are given in Table 7.5.3.3-1 and Table 7.5.3.3-2 below. There is one active cell (PCell) in this test and 24 active Sidelink transmissions in this test (with 12 active Sidelink UEs per configured discovery subframe). Two tests (Test 1 and Test 2) are defined to verify interruptions due to synchronous (Test 1) and asynchronous (Test 2) ProSe Direct Discovery.

The tests consist of three successive time periods, with time duration of T1, T2 and T3 respectively.

During T1, the UE is in RRC_IDLE and monitoring the ProSe Direct Discovery announcements from other active Sidelink UEs on the ProSe Direct Discovery resources.

During T2, the test system establishes a RRC connection with the UE. No PDSCH traffic is scheduled for UE during T2, and the UE is expected to transmit *SidelinkUEInformation* indicating *discRxInterest* during T2. On reception of *SidelinkUEInformation*, the test system shall RRC reconfiguration message to the UE and wait for the UE to respond with RRC reconfiguration complete message before transitioning to T3. If the UE does not transmit *SidelinkUEInformation* for up to [2] sec, the test system shall transition to T3.

During T3, the UE is scheduled with PDSCH traffic on PCell downlink. The test system will count the missed ACK/NACKs during T3 to verify the allowed interruptions during ProSe Direct Discovery.

The normative reference for this requirement is TS 36.133 [4] clause 7.16.3.1 and A.7.5.3.

Table 7.5.3.3-1: Test parameters for interruption due to ProSe Direct Discovery tests

Parameter	Unit	Value		Comment
		Test 1	Test 2	
E-UTRA RF Channel Number		1		
Channel Bandwidth ($BW_{channel}$)	MHz	5		
Active cell		Cell 1		E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal		
T1	s	5.12		
T2	s	Up to receiving RRC reconfiguration setup complete from the UE, or up to [2] sec if UE does not transmit *SidelinkUEInformation* during this period.		
T3	s	10.24		

Table 7.5.3.3-2: ProSe Direct Discovery configuration for interruption due to ProSe Direct Discovery tests

Parameter	Unit	Value		Comment
		Test 1	Test 2	
E-UTRA RF Channel Number		1		UL carrier frequency
Channel Bandwidth ($BW_{channel}$)	MHz	5		
ProSe Direct Discovery resource pool configuration		As specified in Table H.6.1.1-1 (Configuration #1)	As specified in Table H.6.1.1-2 (Configuration #2)	IE values unless specified otherwise in this test.
Active Sidelink UEs Configuration		PDP.1.FDD As specified in Table A.6.2-1	PDP.2.FDD As specified in Table A.6.2-1	Transmitting ProSe Direct Discovery (Test 1 and 2) and SLSS (for Test 2)

Table 7.5.3.3-3: Cell specific test parameters for interruption due to ProSe Direct Discovery tests

Parameter		Unit	Cell 1		
			T1	**T2**	**T3**
E-UTRA RF Channel Number			1		
$BW_{channel}$		MHz	5		
UE RRC state			IDLE	CONNECTED	
Paging configuration	defaultPagingCycle		rf256	N/A	
	nB		T / 32		
DRX			N/A	OFF	
PDSCH Reference measurement channel defined in A.3.1.1.1 Note1			N/A	None	R.5 FDD
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 Note1			R.11 FDD		
OCNG Pattern			OP.16 FDD		
PBCH_RA		dB	0		
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note 1					
OCNG_RB Note 1					
N_{oc} Note2		dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$		dB	16		
RSRP Note3		dBm/15 kHz	-82		
SCH_RP Note 3		dBm/15 kHz	-82		
Propagation Condition			AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

7.5.3.4 Test description

7.5.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure FFS.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.5.3.4.2 Test procedure

There is one active cell (PCell) in this test and 24 active Sidelink transmissions in this test (with 12 active Sidelink UEs per configured discovery subframe). Two tests (Test 1 and Test 2) are defined to verify interruptions due to synchronous (Test 1) and asynchronous (Test 2) ProSe Direct Discovery.

1. Ensure the UE is in FFS according to TS 36.508 [7] clause FFS.
2. Set the parameters according to Test 1 time period T1 in Tables 7.5.3.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. UE is in idle mode in T1 and is monitoring ProSe Direct Discovery announcements from other active Sidelink UEs.
4. On the expiry of T1, TE pages the UE and establishes a RRC Connection with the UE. TE doesn't schedules any PDSCH traffic to the UE.
5. UE is expected to send a Sidelink UEInformation indicating discRxInterest, upon reception, TE is expected to send a RRC Connection reconfiguration message to the UE.
6. Once the UE sends RRC reconfiguration complete message or [2] secs have elapsed after start of T2, start T3.
7. During T3, TE schedules PDSCH traffic on PCell and counts ACK/NACK and record the same.
8. For Test 1, at least 98.75% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. For Test 2, at least 97.5% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE.
9. Repeat steps 1 to 8 for Test 2.
10. A UE is considered pass if it meets the test requirements defined in 7.5.3.5 for both Test 1 and Test 2.

7.5.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions FFS.

7.5.3.5 Test requirement

Tables 7.5.3.5-1 define the primary level settings including test tolerances for interruptions due to ProSe Direct discovery.

Table 7.5.3.5-1: Cell specific test requirement parameters for interruption due to ProSe Direct Discovery tests

Parameter		Unit	Cell 1		
			T1	T2	T3
E-UTRA RF Channel Number			1		
$BW_{channel}$		MHz	5		
UE RRC state			IDLE	CONNECTED	
Paging configuration	defaultPagingCycle		rf256	N/A	
	nB		T / 32		
DRX			N/A	OFF	
PDSCH Reference measurement channel defined in A.3.1.1.1[Note1]			N/A	None	R.5 FDD
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1[Note1]			R.11 FDD		
OCNG Pattern			OP.16 FDD		
PBCH_RA		dB	0		
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note 1]					
OCNG_RB[Note 1]					
N_{oc} [Note2]		dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$		dB	16		
RSRP [Note3]		dBm/15 kHz	-82 +TT		
SCH_RP [Note 3]		dBm/15 kHz	-82		
Propagation Condition			AWGN		
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall be scheduled on PCell continuously during T3.

In Test 1, at least 98.75% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. The missed ACK/NACKs can occur only on subframe 'n', if either n±1 subframe is a discovery subframe, or if n-3, or n-5 is a discovery subframe.

NOTE 1: For the test configuration in Table 7.5.3.5-1, the specific subframes where missed ACK/NACKs are allowed are when (subframe mod 320) = 159, 163, 162, 166, corresponding to allowed interruptions on subframe 159 and 162.

In Test 2, at least 97.5% of all expected ACK/NACKs during T3 shall be transmitted by the ProSe UE. The missed ACK/NACK can occur only on subframe 'n', if either n±5 subframe is a discovery or SLSS subframe, or if n+1, or n-9 is a discovery or SLSS subframe.

NOTE 2: For the test configuration in Table 7.5.3.5-1, the specific subframes where missed ACK/NACKs are allowed are when (subframe mod 320) = 135, 139, 145, 149, 155, 159, 166, 170, corresponding to allowed interruptions on subframes 135, 145, 155 and 166.

7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Call procedure of the test case needs to be tweaked
- Test case applicability is undefined.
- Message contents are TBD.
- Connection diagrams are TBD
- PDSCH scheduling and OCNG configuration during discovery is under investigation.

7.5.4.1 Test purpose

To verify the timing requirements of a UE for ProSe Direct Communication transmissions when PCell downlink timing is used as a reference.

7.5.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE FFS.

7.5.4.3 Minimum conformance requirements

The requirements in this subclause are applicable when the reference timing used for ProSe transmissions is the serving cell (RRC_IDLE) or PCell (RRC_CONNECTED). The sidelink transmissions takes place $(N_{\mathrm{TA,SL}} + N_{\mathrm{TA\,offset}}) \cdot T_{\mathrm{s}}$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell, where $N_{\mathrm{TA\,offset}}$ is specified in Section 8.1 of [9]. The value of $N_{\mathrm{TA,SL}}$ differs between sidelink channels and signals, and is either $N_{\mathrm{TA,SL}} = N_{\mathrm{TA}}$ or $N_{\mathrm{TA,SL}} = 0$ as specified in Section 9.9 of [9].

The normative reference for this requirement is TS 36.133 [4] clause 7.16.2.1.1 and A.7.5.4.

Table 7.5.4-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

7.5.4.4 Test description

7.5.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure FFS
2. Propagation conditions are set according to Annex B clause B.0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.5.4.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting PSDCH used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode 4 is activated.
2. Set the parameters according to Test 1 in Tables 7.5.4.5-1, as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall check that the ProSe UE SLSS transmit timing offset is within the limits specified in Table 7.5.4.5-2 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
4. The SS adjusts the downlink timing for Cell 1 to a delay of $+32 \times T_S$ (approximately +1 μs) compared to that in step 3.
5. After waiting for one SLSS period (40ms), the SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.5.4.5-2.
6. The SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

7.5.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions FFS.

7.5.4.5 Test requirement

Tables 7.5.4.5-1 defines the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.5.4.5-2, define the UE uplink timing include Test Tolerances.

Table 7.5.4.5-1: Test parameters for ProSe Transmission Timing Accuracy test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	Note 5
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
drx-Configuration		DRX_P1	As specified in Table C.3.4.2
ProSe Direct Communication configuration		As specified in Table H.6.1.2-1: (Configuration #1)	IE values unless specified otherwise in this test.
networkControlledSyncTx		ON	Configured
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		5 MHz: R.11 FDD 10 MHz: R.6 FDD	
OCNG Pattern[Note2]		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA[Note3]			
OCNG_RB[Note3]			
N_{oc}	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	3.30	
RSRP [Note4]	dBm/15 kHz	-94.7	
SCH_RP [Note 4]	dBm/15 kHz	-94.7	
Propagation condition		AWGN	
Note 1: For the reference measurement channels, see clause A.3.1. Note 2: For the OCNG pattern, see clause A.3.2. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: This test is according to the principle defined in section A.3.12.3.			

The UE transmit timing offset shall be within the requirements in Table 7.5.4.5-2.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}})\times T_{\mathrm{s}}$.

Table 7.5.4.5-2: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_{e}
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9].	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

8 UE Measurements Procedures

When the UE is in RRC_CONNECTED state on a cell, UE reports measurement information in accordance with the measurement configuration as provided by the System Simulator. To initiate a specific measurement, the System Simulator sends a 'RRC Connection Reconfiguration message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), after that the measurement reporting process takes place. In this process when the reporting criteria are fulfilled the UE sends a 'Measurement Report message' to the System Simulator including the measurement ID and the results. The reporting criteria that trigger the UE to send a 'Measurement Report message' to the System Simulator is event-triggered as defined in TS 36.331 [5] clause 5.5.3. The measurement reporting succeeds only if the measurement report is sent within the specified measurement reporting delay period.

The reference channels in this section assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3.

8.1 E-UTRAN FDD intra frequency measurements

8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.1.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.1.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$ is 800 ms.

T_{Intra}: This is the minimum time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in clause 9.1.5.1 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated, the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells, where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathrm{Y}_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathrm{T}_{\text{Intra}}}{\mathrm{T}_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

Where:

$X_{basic\ measurement\ FDD}$ = 8 (cells).

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected. The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.1.

8.1.1.4 Test description

8.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.1.5 Test requirement

Tables 8.1.1.4.1-1 and 8.1.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells

8.1.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.1.2.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$ is 800 ms.

T_{Intra}: This is the minimum time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated, the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells, where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ intra} = Floor\left\{ X_{basic\ measurement\ FDD} \cdot \frac{T_{Intra}}{T_{Measurement\_Period,\ Intra}} \right\} \text{cells}$$

Where:

$X_{basic\ measurement\ FDD}$ = 8 (cells).

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for intra-frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.2.

8.1.2.4 Test description

8.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.1.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.2.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.2.5-2
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	5	

8.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.2.5-1. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10.Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.2.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.2.5 Test requirement

Tables 8.1.2.4.1-1, 8.1.2.5-1, and 8.1.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.2.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

8.1.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.1.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as defined in table 8.1.2.2.1.2-1 of TS 36.133 [4] clause 8.1.2.2.1.2.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state with DRX cycles of 80 ms or greater the measurement period for intra frequency measurements is $T_{measure\_intra}$ as defined in table 8.1.2.2.1.2-2 of TS 36.133 [4] clause 8.1.2.2.1.2. The UE shall be capable of performing RSRP and RSRQ measurement for 8 identified intra frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.3.

8.1.3.4 Test description

8.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.1.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.3.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	dB	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.3.5-2
Time offset between cells		3 µs		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.3.5-1 and 8.1.3.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 842 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.3.4.1-1 as appropriate.

8.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.3.5 Test requirement

Tables 8.1.3.4.1-1, 8.1.3.5-1, 8.1.3.5-2 and 8.1.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
SCH_RP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.1.3.5-2: DRX Configuration to be used for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.3.5-3: TimeAlignmentTimer and sr-ConfigIndex-Configuration to be used for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	

TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 800 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 842 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.4 Void

8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.1.5.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of intra-frequency SI acquisition for HO.

8.1.5.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI, intra}} = T_{\text{basic\_identify\_CGI, intra}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI, intra}}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI,.intra}}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than 60 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.3 and A.8.1.5.

8.1.5.4 Test description

8.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.1.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.5.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.5.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.5.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.5.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170ms at least 80 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.5.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.5.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.5.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.5.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.5.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.5.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.5.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.5.4.3-8: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.1.5.4.3-9: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.1.5.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.5.4.3-11: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.5.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.5.5 Test requirement

Tables 8.1.5.4.1-1 and 8.1.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.1.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133 [4] Section 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.1.6.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX.

8.1.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of intra-frequency SI acquisition for HO. Applicability requires support for FGI bit 5

8.1.6.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI, intra}} = T_{\text{basic\_identify\_CGI, intra}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI, intra}}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI,.intra}}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.3 and A.8.1.6.

8.1.6.4 Test description

8.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.1.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.6.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.6.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.1.6.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.6.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.6.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.6.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.6.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.6.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.6.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.6.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.6.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.6.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.6.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.6.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.6.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.6.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.6.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.6.4.3-13: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.1.6.5 Test requirement

Tables 8.1.6.4.1-1, 8.1.6.5-1, 8.1.6.5-2 and 8.1.6.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used test.

Table 8.1.6.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 8.1.6.5-2: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8]

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,intra} = T_{basic\_identify\_CGI,intra} \quad ms$$

$T_{basic\_identify\_CGI, intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.7 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

8.1.7.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction and non-MBSFN ABS configured in the aggressor cell.

8.1.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

8.1.7.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E-UTRA\_FDD\_eICIC,intra} \cdot \frac{T_{Measurement\_Period\_eICIC,Intra}}{T_{Intra}} \quad ms$$

where

> $T_{basic\_identify\_E-UTRA\_FDD\_eICIC, intra}$ is 1000 ms.
>
> T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_eICIC, Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_eICIC}$ cells , where $Y_{measurement\_intra\_eICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_eICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_eICIC} = Floor\left\{ X_{basic\_measurement\_FDD\_eICIC} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_eICIC, Intra}} \right\} \text{ cells}$$

where

$X_{basic\_measurement\_FDD\_eICIC}$ = 8 (cells)

$T_{Measurement\_Period\_eICIC, Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_eICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_eICIC}$ defined above becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_eICIC, Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.1 and A.8.1.7.

8.1.7.4 Test description

8.1.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15.
2. The general test parameter settings are set up according to Table 8.1.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.7.4.3.

5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.1.7.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
PCell		Cell 1	Also the aggressor cell. Active in T1 and T2
Neighbour cell		Cell 2	Cell to be identified. Active only in T2.
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For all cells in the test
A3-Offset	dB	-11	
Event A3 measurement quantity		RSRP	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 !=0	Cell PCIs are selected so that the condition is met
ABS pattern		'1000000010000000100000001000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1 during T1. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'1000000010000000100000001000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 2 measurements.
Time domain measurement resource restriction pattern for PCell measurements		'0100000001000000010000000100000001000000'	Configured during T1 for Cell 1 measurements

8.1.7.4.2 Test procedure

There are two synchronous E-UTRA cells in the test on the same RF channel. Cell 1 is the Pcell and also the aggressor cell, Cell 2 is the neighbour victim cell to be identified. Non-MBSFN ABS pattern is configured for aggressor cell (Cell 1). The UE is configured with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells (Cell 2). The UE is also configured with a time domain measurement resource restriction pattern for PCell (Cell 1) measurements. It is indicated to the UE that event-triggered reporting with Event A3 is used.

The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 2. The information for both measurement patterns shall be provided to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 8.1.7.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.7.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.7.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-22 (-11 dB)	-11 is actual value in dB (-22 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.7.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.7.4.3-5: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		FDD with E-UTRA FDD neighbour cell
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	‘1000000010000000100000001000000010000000’	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 8.1.7.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD-FDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	‘0100000001000000010000000100000001000000’	BIT STRING (SIZE (40))	Cell1
}			
}			
}			

8.1.7.5 Test requirements

Table 8.1.7.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and in D.1.6 (OP.6 FDD)		OP.5 FDD		OP.6 FDD	
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
$(\hat{E}_s / N_{oc})_{meas}$ Note 5	dB	1	1	-Infinity	-3.2
$(\hat{E}_s / N_{oc})_{ABS}$	dB	1	1	N/A	N/A
RSRP Note 4,5	dBm/15 kHz	-97	-97	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-97	-97	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$	dB	1	-0.7	-Infinity	-3.2
SCH $\hat{E}_s / I_{ot}$	dB	1	-0.7	-Infinity	-6.74
Propagation Condition		ETU30			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: RSRP is estimated for Cell 2 during the restricted measurement subframes for neighbour cells. RSRP is estimated for Cell 1 during the PCell restricted subframes.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_eICIC}$

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E-UTRA\_FDD\_eICIC,intra} \cdot \frac{T_{Measurement\_Period\_eICIC,Intra}}{T_{Intra}} \quad ms$$

$T_{basic\_identify\_E-UTRA\_FDD\_eICIC,\ intra}$ = 1000 ms

$T_{Measurement\_Period\_eICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

8.1.8.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

8.1.8.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

8.1.8.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E-UTRA\_FDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E-UTRA\_FDD\_FeICIC,\ intra}$ is 1000 ms.

T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_eICIC,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cells indicated in the CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_FeICIC}$ cells , where $Y_{measurement\_intra\_FeICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_FeICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement\_intra\_FeICIC}} = Floor\left\{ X_{\text{basic\_measurement\_FDD\_FeICIC}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period\_FeICIC, Intra}}} \right\} \text{ cells}$$

where

$X_{basic\_measurement\_FDD\_FeICIC}$ = 8 (cells).

$T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_eICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FeICIC}$ defined above becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_FeICIC,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.3 and A.8.1.8.

8.1.8.4 Test description

8.1.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.54.

2. The general test parameter settings are set up according to Table 8.1.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.8.4.3.

5. In this test, there are three E-UTRA cells, Cell 1, Cell 2 and Cell 3, all on same frequencies. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.1.8.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
PCell			Cell 1	Also a first interfering cell to Cell 3. Active in T1 and T2.
Neighbour cells			Cell 2 and Cell 3	Cell 2 is a second interfering cell; Cell 2 is active in T1 and T2. Cell 3 is the cell to be identified; Cell 3 is active only in T2.
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number			1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	For all cells in the test
A3-Offset		dB	-14	
Event A3 measurement quantity			RSRP	
CP length			Normal	
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
Time offset between cells		µs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
T1		S	5	
T2		S	5	
Physical cell IDs			$(PCI_{cell1} - PCI_{cell3})\mathrm{mod}6 = 0$ $(PCI_{cell2} - PCI_{cell3})\mathrm{mod}6 \mathrel{!=} 0$ PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'1000000010000000100000010000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 1 and Cell 2 during T1.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'1000000010000000100000010000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time domain measurement resource restriction pattern for PCell measurements			'0100000001000000010000000100000001000000'	Configured during T1 for Cell 1 measurements
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

8.1.8.4.2 Test procedure

The test parameters are given in Tables 8.1.8.4.1-1 and 8.1.8.51-1. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test, there are three synchronous cells, Cell 1, Cell 2, and Cell 3, on the same RF channel. Cell 1 is the PCell. Cell 3 is the cell to be identified. A non-MBSFN ABS pattern is configured in each of the Cell 1 and Cell 2 during the entire test. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 3.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1 and Cell 2 according to T1 in Table 8.1.8.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 for Cell 1, Cell 2, and Cell 3 as specified in Table 8.1.8.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Formulas are applied until PCI-s values are found, which fulfill the PCI conditions described in Table 8.1.8.4.1-1.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 5.2A.5.1 with the following exceptions:

Table 8.1.8.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 8.1.8.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-28 (-14 dB)	-14 is actual value in dB (-28 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
maxReportCells	2		
}			

Table 8.1.8.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.8.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
physCellId	PhysCellId of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.8.4.3-5: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

Table 8.1.8.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	‘0100000001000000010000000100000001000000’	BIT STRING (SIZE (40))	Cell1
}			
}			
}			

8.1.8.5 Test requirements

Tables 8.1.8.4.1-1 and 8.1.8.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS test.

Table 8.1.8.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		1		1	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and in D.1.6 (OP.6 FDD)		OP.5 FDD		OP.6 FDD		N/A	OP.6 FDD
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1		N/A	0
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
$(\hat{E}_s / N_{oc})$	dB	4	4	2	2	-Infinity	-3.20
RSRP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$ Note 5	dB	4	2.30	2	0.30	-Infinity	-8.66
SCH $\hat{E}_s / I_{ot}$	dB	-0.12	-0.86	-3.45	-4.01	-Infinity	-10.27
Propagation Condition		ETU30		ETU30		ETU30	

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
NOTE 4: RSRP, SCH_RP, and $\hat{E}_s / I_{ot}$ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: Applies during the restricted measurement subframes configured for neighbour cell (Cell 3) measurements.

The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_FeICIC}$

$$T_{identify\_ intra\_FeICIC} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_FeICIC,\ intra}$ is 1000 ms.

$T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth

8.1.9.1 Test purpose

Same test purpose as defined in clause 8.1.1.1.

8.1.9.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31.

8.1.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.1.3 with the following exceptions:

- Instead of A.8.1.1 → use A.8.1.9.

8.1.9.4 Test description

8.1.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.1.9.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.9.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.9.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
Note 1: See Table 8.1.1.4.1-1 for the other parameters. Note 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

8.1.9.4.2 Test procedure

Same test procedure as defined in clause 8.1.1.4.2 with the following exceptions:

- Instead of Table 8.1.1.5-1 → use Table 8.1.9.5-1.

8.1.9.4.3 Message contents

Same message contents as defined in clause 8.1.1.4.3.

8.1.9.5 Test requirement

Same test requirement as defined in clause 8.1.1.5 with the following exceptions:

Tables 8.1.9.4.1-1 and 8.1.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth test.

Table 8.1.9.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
BWchannel	MHz	5		5	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)		OP.15 FDD		OP.16 FDD	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: See Table 8.1.1.5-1 for the other parameters.					

8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth

8.1.10.1 Test purpose

Same test purpose as defined in clause 8.1.3.1.

8.1.10.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that only support E-UTRA Band 31. Applicability requires support for FGI bit 5.

8.1.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.3.3 with the following exceptions:

- Instead of A.8.1.3 → use A.8.1.10.

8.1.10.4 Test description

8.1.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.1.10.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.10.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.10.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used for 5MHz bandwidth

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.5 FDD		As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD		As specified in clause A.2.1
Channel Bandwidth (BWchannel)	MHz	5		
NOTE 1: See Table 8.1.3.4.1-1 for the other parameters. NOTE 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.				

8.1.10.4.2 Test procedure

Same test procedure as defined in clause 8.1.3.4.2 with the following exceptions:

- Instead of Table 8.1.3.5-1 → use Table 8.1.10.5-1.

8.1.10.4.3 Message contents

Same message contents as defined in clause 8.1.3.4.3.

8.1.10.5 Test requirement

Same test requirement as defined in clause 8.1.3.5 with the following exceptions:

Tables 8.1.10.4.1-1, 8.1.10.5-1, 8.1.3.5-2 and 8.1.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used for 5MHz bandwidth test.

Table 8.1.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions for 5MHz bandwidth

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
$BW_{channel}$	MHz	5		5	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD		OP.16 FDD	
NOTE: See Table 8.1.3.5-1 for the other parameters.					

8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0

8.1.11.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.11.2 Test applicability

This test applies to all type of E-UTRA FD-FDD UE release 12 and forward of UE Category 0.

8.1.11.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

- $T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms
- T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement\_intra\_UE cat 0}} = Floor\left\{ X_{\text{basic\_measurement\_FDD\_UE cat 0}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period\_UE cat 0, Intra}}} \right\}$$

cells where

- $X_{\text{basic measurement FDD\_UE cat 0}}$ = 8 (cells)
- $T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify\_intra\_UE cat 0}}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat 0}}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.1 and A.8.1.11.

8.1.11.4 Test description

8.1.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.11.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.11.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.11.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.1.11.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.11.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.11.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.11.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.11.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.11.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.11.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.11.5 Test requirement

Tables 8.1.11.4.1-1 and 8.1.11.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.11.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	6.10	--0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
SCH_RP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

8.1.12.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.12.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.12.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{\text{identify\_intra\_UE cat 0}}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{\text{identify\_intra\_UE cat 0}} = T_{\text{basic\_identify\_E-UTRA\_FDD\_UE cat 0}} \cdot \frac{T_{\text{Measurement\_Period\_UE cat 0, Intra}}}{T_{\text{Intra}}} \quad ms$$

Where:

$T_{\text{basic\_identify\_E-UTRA\_FDD\_UE cat 0, intra}}$ is 1000 ms

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{\text{Measurement\_Period\_UE cat 0 Intra}}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra\_UE cat 0}}$ cells , where $Y_{\text{measurement intra\_UE cat 0}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra\_UE cat 0}}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement\_intra\_UE cat 0}} = Floor\left\{ X_{\text{basic\_measurement\_FDD\_UE cat 0}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period\_UE cat 0, Intra}}} \right\}$$

cells where

$X_{\text{basic measurement FDD\_UE cat 0}}$ = 8 (cells)

$T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify\_intra\_UE cat 0}}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat 0}}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.1 and A.8.1.12.

8.1.12.4 Test description

8.1.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.12.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.12.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.12.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.12.5-2
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.12.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.12.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.12.5-1. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.12.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.12.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.12.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.12.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.12.5 Test requirement

Tables 8.1.12.4.1-1, 8.1.12.5-1 and 8.1.12.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.12.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.96
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
SCH_RP Note 4	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.12.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

8.1.13.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.13.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.13.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.13.3-1.

Table 8.1.13.3-1: Requirement to identify a newly detectable FDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	[1] (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	Note2(20)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.13.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.13.3-2: Requirement to measure FDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08<DRX-cycle≤2.56	Note2 (5)
Note 1: Number of DRX cycle depends upon the DRX cycle in use Note 2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.1.2 and A.8.1.13

8.1.13.4 Test description

8.1.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.13.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.13.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.13.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.13 FDD		As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in clause A.2.1
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.13.5-2
Time offset between cells		3 μs		Synchronous cells
T1	s	5		
T2	s	5	30	

8.1.13.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.13.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 start.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.13.5-1 and 8.1.13.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.13.4.1-1 as appropriate.

8.1.13.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.13.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.13.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.13.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.13.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.13.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.13.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.13.5 Test requirement

Tables 8.1.13.4.1-1, 8.1.13.5-1, 8.1.13.5-2 and 8.1.13.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.13.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
RSRP Note 3	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
SCH_RP Note 3	dBm/15 KHz	-91.9	-91.9	-Infinity	-91.9
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.13.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.13.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.14 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- TT is TBD

- Test system uncertainties is TBD

8.1.14.1 Test purpose

To verify the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements.

8.1.14.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.14.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{\text{identify intra\_UE cat 0}} = T_{\text{basic\_identify\_E-UTRA\_FDD\_UE cat 0}} \cdot \frac{T_{\text{Measurement\_Period\_UE cat 0, Intra}}}{T_{\text{Intra}}} \quad ms$$

where

$T_{\text{basic\_identify\_E-UTRA\_FDD\_UE cat 0, intra}}$ is 1000 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{\text{Measurement\_Period\_UE cat 0 Intra}}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra\_UE cat 0}}$ cells , where $Y_{\text{measurement intra\_UE cat 0}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra\_UE cat 0}}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement\_intra\_UE cat 0}} = Floor\left\{ X_{\text{basic\_measurement\_FDD\_UE cat 0}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period\_UE cat 0, Intra}}} \right\}$$

cells where

$X_{\text{basic measurement FDD\_UE cat 0}}$ = 8 (cells)

$T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify intra\_UE cat 0}}$ defined in TS 36.133 [4] Clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat 0}}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.2.1 and A.8.1.14.

8.1.14.4 Test description

8.1.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.14.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.14.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.14.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.1.14.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell..
2. Set the parameters according to T1 in Table 8.1.14.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.14.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   -switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.14.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.14.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.14.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.14.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.14.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.14.5 Test requirement

Table 8.1.14.4.1-1 and 8.1.14.5.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Table 8.1.14.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.15 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- TT is TBD

- Test system uncertainties is TBD

8.1.15.1 Test purpose

To verify the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements.

8.1.15.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.15.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ \ intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra}$ is 1000 ms.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{\text{Measurement\_Period\_UE cat 0 Intra}}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the low complexity UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra\_UE cat 0}}$ cells , where $Y_{\text{measurement intra\_UE cat 0}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra\_UE cat 0}}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement\_intra\_UE cat 0}} = Floor\left\{ X_{\text{basic\_measurement\_FDD\_UE cat 0}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period\_UE cat 0, Intra}}} \right\}$$

cells where

$X_{\text{basic measurement FDD\_UE cat 0}}$ = 8 (cells);

$T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify intra\_UE cat 0}}$ defined in TS 36.133 [4] Clause 8.5.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat 0}}$ defined in TS 36.133 [4] clause 8.5.2.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat 0, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.2.1 and A.8.1.15.

8.1.15.4 Test description

8.1.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 (using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.1.15.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.15.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.15.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.15.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell..

2. Set the parameters according to T1 in Table 8.1.15.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.15.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
-switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.15.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.15.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.15.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.15.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.15.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.15.5 Test requirement

Table 8.1.15.4.1-1 and 8.1.15.5.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.15.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.16 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- TT is TBD

- Test system uncertainties is TBD

8.1.16.1 Test purpose

To verify the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements.

8.1.16.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward with support of intra-frequency SI acquisition for HO of UE category 0.

8.1.16.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in table 8.1.16.3-1.

Table 8.1.16.3-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	1 (Note1)
0.04<DRX-cycle≤0.08	Note2 (50)
0.128	3.2 (32)
0.128<DRX-cycle≤2.56	Note2(25)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in table 8.1.16.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.16.3-2: Requirement to measure HD-FDD intrafrequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	0.4 (Note1)
0.04<DRX-cycle≤0.16	Note2 (7)
0.16<DRX-cycle≤2.56	Note2(5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] Clause 8.5.2.1.1.2 When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.2.2 and A.8.1.16.

8.1.16.4 Test description

8.1.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.16.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.16.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.16.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.1 HD-FDD	As specified in clause A.3.1.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.3 HD-FDD	As specified in clause A.3.1.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in clause A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.16.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.16.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.16.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.16.4.1-1 as appropriate.

8.1.16.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.16.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.16.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.16.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.16.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.16.4.3-5: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.16.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.16.5 Test requirement

Table 8.1.16.4.1-1 and A.8.1.16.5.1-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.16.5.1-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1000 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0

8.1.17.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra-frequency cell search requirements.

8.1.17.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.17.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ 0}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_UE\ cat\ 0,\ intra}$ is 1000 ms

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 400 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 400 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra\_UE\ cat\ 0}$ cells , where $Y_{measurement\ intra\_UE\ cat\ 0}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ ,intra\_UE\ cat\ 0}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\ \ intra\_UE\ cat\ 0} = Floor\left\{ X_{basic\ measurement\ TDD\_UE\ cat\ 0} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}} \right\}$$

cells where

$X_{basic\ measurement\ TDD\_UE\ cat\ 0}$ = 8 (cells)

$T_{Measurement\_Period\ intra\_UE\ cat\ 0}$ = 400 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clauses 8.5.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clauses 8.5.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.3.1 and A.8.1.17.

8.1.17.4 Test description

8.1.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.17.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.17.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.17.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.12 TDD	As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.17.5-2
Time offset between cells		3 µs	Synchronous cells
T1	s	5	
T2	s	5	

8.1.17.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.17.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.17.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.17.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.17.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.17.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.17.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.17.5 Test requirement

Tables 8.1.17.4.1-1, 8.1.17.5-1 and 8.1.17.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.17.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP Note 4	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.17.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$$T_{identify\_intra\_UE\ cat\ 0} = T_{basic\_identify\_E-UTRA\_TDD\_UE\ cat\ 0,\ intra} \cdot \frac{T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_TDD\_UE\ cat\ 0}$ = 1000 ms

$T_{Measurement\_Period\_UE\ cat\ 0,\ Intra}$ = 400 ms

T_{Intra} = 400 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0

8.1.18.1 Test purpose

To verify the category 0 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.1.18.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of UE category 0. Applicability requires support for FGI bit 5.

8.1.18.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.18.3-1.

Table 8.1.18.3-1: Requirement to identify a newly detectable TDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.04	1 (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	Note2(20)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clause 9.1.13.1 and 9.1.13.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.13.3 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ 0}$ as shown in Table 8.1.18.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ 0}$.

Table 8.1.18.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ 0}$ (s) (DRX cycles)
≤0.08	0.4 (Note1)
0.08<DRX-cycle≤2.56	Note2 (5)
Note 1: Number of DRX cycle depends upon the DRX cycle in use. Note 2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.13.1 and 9.1.13.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.13.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.1.13.1, 9.1.13.2 and 9.1.13.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ 0}$ defined in TS 36.133 [4] clause 8.5.2.1.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ 0}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.3.2 and A.8.1.18

8.1.18.4 Test description

8.1.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.18.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.18.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.18.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.12 TDD		As specified in clause A.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in clause A.2.2
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.18.5-2
Time offset between cells		3 µs		Synchronous cells
T1	s	5		
T2	s	5	30	

8.1.18.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.18.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.18.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1042 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.18.4.1-1 as appropriate.

8.1.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.18.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.18.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.1.18.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.18.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.1.18.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.18.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.18.5 Test requirement

Tables 8.1.18.4.1-1, 8.1.18.5-1, 8.1.18.5-2 and 8.1.18.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.18.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		2x1		2x1	
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP Note 3	dBm/15 kHz	-91.4	-91.4	-Infinity	-91.4
$\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.18.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.18.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 1000 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 1s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1042 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ 0}$

$T_{identify\_intra\_UE\ cat\ 0}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ 0}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

8.1.19.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for UE category 0.

8.1.19.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 12 and forward with support of intra-frequency SI acquisition for HO of UE category 0.

8.1.19.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI\_LC-UE, intra}} = T_{\text{basic\_identify\_CGI\_LC-UE, intra}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI\_LC-UE, intra}}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI\_LC-UE,.intra}}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{\text{identify\_CGI\_LC-UE, intra}}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.4 and A.8.1.19.

8.1.19.4 Test description

8.1.19.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.19.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.19.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.19.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.15 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.19.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.19.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.19.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210ms at least 112 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 210 ms, and the UE have more than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.19.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.19.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.19.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.19.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.19.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.19.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	r1		
si-RequestForHO-r9	setup		
}			

Table 8.1.19.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.19.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.19.4.3-8: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.1.19.4.3-9: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2
}			

Table 8.1.19.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.19.4.3-11: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.19.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.19.5 Test requirement

Tables 8.1.19.4.1-1 and 8.1.19.5-1 define the primary level settings including test tolerances for E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 test.

Table 8.1.19.5-1: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined inD.1.10 (OP.10 FDD) and in D.1.2(OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\,intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

$T_{basic\_identify\_CGI,\,intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 207 ms, allow 210 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 112 ACK/NACK number is caused by two parts. Firstly, at least 92 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Clause 8.5.2.1.4. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier of cell.

8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

8.1.20.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps with DRX for UE category 0.

8.1.20.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward with support of intra-frequency SI acquisition for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.1.20.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\,intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\,intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC-UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC-UE,intra}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.4 and A.8.1.20.

8.1.20.4 Test description

8.1.20.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1 Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.1.20.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.20.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.20.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.14 FDD	As specified in clause A.1.3
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.20.5-2
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.20.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.20.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.20.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.20.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.20.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.20.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.20.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.20.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.20.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.20.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.20.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.20.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.20.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	r1		
si-RequestForHO-r9	setup		
}			

Table 8.1.20.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.20.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.20.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.20.4.3-13: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.1.20.5 Test requirement

Tables 8.1.20.4.1-1, 8.1.20.5-1, 8.1.20.5-2 and 8.1.20.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 test.

Table 8.1.20.5-1: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.20.5-2: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.20.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, intra} = T_{basic\_identify\_CGI, intra} \quad ms$$

$T_{basic\_identify\_CGI, intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 207 ms, allow 210 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

8.1.21.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for UE category 0.

8.1.21.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward with support of intra-frequency SI acquisition for HO of UE category 0.

8.1.21.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE, intra} = T_{basic\_identify\_CGI\_LC\text{-}UE, intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC-UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC-UE,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $T_{identify\_CGI\_LC-UE,\ intra}\ ms$, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

For the UE supporting half duplex FDD operation there is no requirement in terms of number of ACK/NACK transmission on PCell.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.5 and A.8.1.21.

8.1.21.4 Test description

8.1.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.21.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.21.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.21.4.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.2 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.4 HD-FDD	As specified in clause A.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.1.21.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.1.21.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.21.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210ms at least 112 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 210 ms, and the UE have more than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 112 ACK/NACKs transmitted from the start of T3 until 210 ms, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.21.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.21.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.21.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.21.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.21.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.21.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	r1		
si-RequestForHO-r9	setup		
}			

Table 8.1.21.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.21.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.21.4.3-8: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.1.21.4.3-9: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 2
}			

Table 8.1.21.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.21.4.3-11: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.21.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.1.21.5 Test requirement

Tables 8.1.21.4.1-1 and 8.1.21.5-1 define the primary level settings including test tolerances for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0 test.

Table 8.1.21.5-1: Cell specific test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s / I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, intra} = T_{basic\_identify\_CGI, intra} \quad ms$$

$T_{basic\_identify\_CGI, intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 207 ms, allow 210 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 210 ms at least 112 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

8.1.22.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps with DRX for UE category 0.

8.1.22.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 12 and forward with support of intra-frequency SI acquisition for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.1.22.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to clause 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$\mathrm{T}_{\text{identify\_CGI\_LC-UE, intra}} = \mathrm{T}_{\text{basic\_identify\_CGI\_LC-UE, intra}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI\_LC-UE, intra}}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI\_LC-UE,.intra}}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [5] are used.

Within the time, $\mathrm{T}_{\text{identify\_CGI\_LC-UE, intra}}\ ms$, over which the UE identifies the new CGI of E-UTRA cell, the UE shall transmit at least 92 ACK/NACKs on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

For the UE supporting half duplex FDD operation there is no requirement in terms of number of ACK/NACK transmission on PCell.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.5 and A.8.1.22.

8.1.22.4 Test description

8.1.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.1.22.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.22.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.22.4.1-1: General test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.2 HD-FDD	As specified in clause A.1.4
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.4 HD-FDD	As specified in clause A.2.3
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.1.6.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.1.22.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.1.22.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.22.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.22.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.22.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.22.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.1.22.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.1.22.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.22.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.22.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.22.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.1.22.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.1.22.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.1.22.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.1.22.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.1.22.4.3-13: *MeasResults*: Additional E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.1.22.5 Test requirement

Tables 8.1.22.4.1-1, 8.1.22.5-1, 8.1.22.5-2 and 8.1.22.5-3 define the primary level settings including test tolerances for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0 test.

Table 8.1.22.5-1: Cell specific test parameters for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in D.1.1(OP.1 FDD) and in D.1.2(OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
PDCCH_RA	dB	0			0		
PDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	ms	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.22.5-2: DRX configuration for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.22.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, intra} = T_{basic\_identify\_CGI, intra} \quad ms$$

$T_{basic\_identify\_CGI, intra}$ = 190 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 207 ms, allow 210 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA

8.1.23.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.23.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1.

8.1.23.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.23.3-1 when SCH Ês/Iot >= -6 dB.

Table 8.1.23.3-1: Requirement on cell identification delay and measurement delay for FDD intra frequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table I.2.x-1[TBD] for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.23.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.23.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.23.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clauses 8.13.2.1.1.1 and A.8.1.23.

8.1.23.4 Test description

8.1.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.23.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.23.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.23.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	
T1		S	5	
T2		S	5	

8.1.23.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.23.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.23.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [2880+TT] ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.23.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.23.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.23.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.23.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.23.5 Test requirement

Tables 8.1.23.4.1-1 and 8.1.23.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.23.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76+TT	-62.42+TT	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 2880 ms

TTI insertion uncertainty = TT ms

The overall delays measured shall be less than a total of 2880+TT ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus TT ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

8.1.24.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.24.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1.

8.1.24.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.24.3-1 when SCH Ês/Iot >= -6 dB.

Table 8.1.24.3-1: Requirement on cell identification delay and measurement delay for FDD intra frequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table I.2.x-1[TBD] for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.24.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify intra\_UE cat M1}}$ defined in Clause 8.1.24.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat M1}}$ defined in Clause 8.1.24.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat M1, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1.1 and A.8.1.24.

8.1.24.4 Test description

8.1.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.24.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.24.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.24.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	
T1		S	5	
T2		S	5	

8.1.24.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.24.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. The SS shall transmit the RRCConnectionReconfiguration message.

4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.24.5-1.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [2880+TT] ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.24.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.24.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.24.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.24.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.24.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.24.5 Test requirement

Tables 8.1.24.4.1-1 and 8.1.24.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.24.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.76	-62.34	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 2880 ms

TTI insertion uncertainty = TT ms

The overall delays measured shall be less than a total of 2880+TT ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX

8.1.25.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements in DRX for Cat-M1 UE.

8.1.25.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

8.1.25.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.25.3-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.25.3-2.

Table 8.1.25.3-1: Requirement to identify a newly detectable FDD intra frequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	≤0.04	1.44 (Note1)
	0.04<DRX-cycle≤0.08	Note2 (40)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
1	<0.128	2.88 (Note1)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.		

Table 8.1.25.3-2: Requirement to identify a newly detectable FDD intra frequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (20)
NOTE: Time depends upon the eDRX_CONN cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex Table I.2.x-1[TBD] for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.25.3-3. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.25.3-4. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1}$.

Table 8.1.25.3-3: Requirement to measure FDD intra frequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	<0.128	0.48 (Note1)
	0.128≤DRX-cycle≤2.56	Note2 (5)
1	<0.256	0.96 (Note1)
	0.256≤DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.		

Table 8.1.25.3-4: Requirement to measure FDD intra frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5)
NOTE: Time depends upon the eDRX_CONN cycle in use.	

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ M1}$ defined in Clause 8.1.25.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in clause 8.1.25.3 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1.2 and A.8.1.25.

8.1.25.4 Test description

8.1.25.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.25.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.25.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.25.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE when DRX is used

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1	1	One radio channel is used.
Active cell			Cell 1	Cell 1	
Neighbour cell			Cell 2	Cell 2	Cell to be identified.
CP length			Normal	Normal	
DRX			ON	ON	DRX related parameters are defined in Table 8.1.25.5-2
A3	Offset	dB	-6	-6	
	Hysteresis	dB	0	0	
	Time To Trigger	s	0	0	
Filter coefficient			0	0	L3 filtering is not used
Gap pattern ID			0	0	
T1		s	5	5	
T2		s	5	30	

8.1.25.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.25.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.1.25.5-1 and 8.1.25.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [1480+TT] ms for Test 1 or less than [26880+TT] ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

11. Repeat steps 1-10 for each sub-test Table 8.1.25.4.1-1 as appropriate.

8.1.25.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.25.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2a Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.25.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.25.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.25.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.25.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.25.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.25.5 Test requirement

Tables 8.1.25.4.1-1, 8.1.25.5-1, 8.1.25.5-2, and 8.1.25.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX.

Table 8.1.25.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.21 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 FDD		R.17 FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.6	-Infinity	-1.26
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9MHz	-64.7	-62.34	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.25.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.25.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 1440 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 1440 ms.

TTI insertion uncertainty = TT ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1480+TT ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 20 x 1280 ms.

TTI insertion uncertainty = TT ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26880+TT ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.26 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances and test requirement values
- Annex E needs to be updated

8.1.26.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.26.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1.

8.1.26.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.26.3-1 when SCH Ês/Iot >= -6 dB

Table 8.1.26.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-2 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.26.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify intra\_UE cat M1}}$ defined in Clause 8.1.26.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat M1}}$ defined in Clause 8.1.26.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat M1, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clauses 8.13.2.1.2.1 and A.8.1.26.

8.1.26.4 Test description

8.1.26.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.26.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.26.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.26.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	
T1		S	5	
T2		S	5	

8.1.26.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.26.5-1. Propagation conditions are set according to Annex B.1. T1 starts.

3. The SS shall transmit the RRCConnectionReconfiguration message.

4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.26.5-1.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [2882+TT] ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.26.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.26.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.26.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.26.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.26.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.26.5 Test requirement

Tables 8.1.26.4.1-1 and 8.1.26.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Table 8.1.26.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.20 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.16 HD-FDD		R.16 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98+TT			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
RSRP Note 3	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
SCH_RP Note 3	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
Io Note 3	dBm/9MHz	-64.76+TT	-62.42+TT	Specified in Cell 1 columns	
Propagation Condition		ETU70		ETU70	
Antenna Configuration		1x1		1x1	
Timing offset to Cell 1	ms	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = [2880+TT]

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of [2880+TTI insertion uncertainty+TT] ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus TT ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.27 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances and test requirement values
- Annex E needs to be updated

8.1.27.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.27.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1.

8.1.27.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.27.3-1 when SCH Ês/Iot >= -6 dB

Table 8.1.27.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-2 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.27.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurement of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.27.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.27.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.2.1 and A.8.1.27.

8.1.27.4 Test description

8.1.27.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.27.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.27.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.27.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			DRX_L	As specified in TS 36.133 [4] clause A.3.3
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	S	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			1	As specified in TS 36.133 [4] clause 8.1.2.1
T1		S	5	
T2		S	5	

8.1.27.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.27.5-1. Propagation conditions are set according to Annex B clauses B.1. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.27.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [2882+TT] ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.27.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7 Table H.3.6-2

Table 8.1.27.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.27.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.27.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.27.5 Test requirement

Tables 8.1.27.4.1-1 and 8.1.27.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.27.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.20 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.16 FDD		R.16 FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
RSRP Note 3	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
SCH_RP Note 3	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
Io Note 3	dBm/9MHz	-64.76+TT	-62.42+TT	Specified in Cell 1 columns	
Propagation Condition		ETU70		ETU70	
Antenna Configuration		1x1		1x1	
Timing offset to Cell 1	µs	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = [2880+TT]

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of [2880+TTI insertion uncertainty +TT] ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.28 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances and test requirement values
- Annex E needs to be updated

8.1.28.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements in DRX for Cat-M1 UE.

8.1.28.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE Release 13 and forward of UE category M1.

8.1.28.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable HD-FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.28.3-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable HD-FDD intra frequency cell within $T_{identify\_intra\_UE\ cat\ M1}$ as shown in Table 8.1.28.3-2.

Table 8.1.28.3-1: Requirement to identify a newly detectable HD-FDD intrafrequency cell

Gap pattern ID	DRX cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	≤0.04	1.44 (Note1)
	0.04<DRX-cycle≤0.08	Note2 (40)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
1	≤0.08	2.88 (Note1)
	0.128	3.2 (32)
	0.128<DRX-cycle≤2.56	Note2(25)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.28.3-2: Requirement to identify a newly detectable HD-FDD intrafrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{identify\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (25)
NOTE: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.28.3-3. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in Table 8.1.28.3-4. The UE shall be capable of performing RSRP measurements for 6 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1}$.

Table 8.1.28.3-3: Requirement to measure HD-FDD intrafrequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	<0.08	0.48 (Note1)
	0.08≤DRX-cycle≤0.16	Note2 (7)
	0.16<DRX-cycle≤2.56	Note2(5)
1	<0.16	0.96 (Note1)
	DRX-cycle=0.16	1.12 (7)
	0.16<DRX-cycle≤2.56	Note2(5)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.28.3-4: Requirement to measure HD-FDD intrafrequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5)
NOTE: Time depends upon the eDRX_CONN cycle in use	

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra,\ UE\ cat\ M1}$ defined in Clause 8.1.28.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in clause 8.1.28.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.1.2 and A.8.1.28.

8.1.28.4 Test description

8.1.28.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.28.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.28.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.28.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE when DRX is used

Parameter		Unit	Value		Comment
			Test1	Test2	
E-UTRA RF Channel Number			1	1	One radio channel is used.
Active cell			Cell 1	Cell 1	
Neighbour cell			Cell 2	Cell 2	Cell to be identified.
CP length			Normal	Normal	
DRX			ON	ON	DRX related parameters are defined in Table 8.1.28.5-2
A3	Offset	dB	-6	-6	
	Hysteresis	dB	0	0	
	Time To Trigger	s	0	0	
Filter coefficient			0	0	L3 filtering is not used
Gap pattern ID			0	0	As specified in TS 36.133 [4] clause 8.1.2.1.
T1		s	5	5	
T2		s	5	35	

8.1.28.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.28.5-1. Propagation conditions are set according to Annex B.1. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.1.28.5-1 and 8.1.28.5-2.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [1480+TT] ms for Test 1 or less than [26882+TT] ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.
11. Repeat steps 1-10 for each sub-test Table 8.1.28.4.1-1 as appropriate.

8.1.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.28.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2a Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.28.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.28.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.28.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.28.4.3-5: *MeasResults*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.28.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.28.5 Test requirement

Tables 8.1.28.4.1-1, 8.1.28.5-1, 8.1.28.5-2, and 8.1.28.5-3 define the primary level settings including test tolerances for E-UTRAN HD-FDD event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CE in DRX.

Table 8.1.28.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.10 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.6 HD-FDD		R.6 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
RSRP Note 3	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
SCH_RP Note 3	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
Io Note 3	dBm/9MHz	-64.76+TT	-62.42+Tt	Specified in Cell 1 columns	
Propagation Condition		ETU70		ETU70	
Antenna Configuration		1x1		1x1	
Timing offset to Cell 1	μs	-		3	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.28.5-2: DRX-Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.28.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN HD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 1440 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 1440 ms.

TTI insertion uncertainty = [TT] ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1480+TT ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of [26880+ TTI insertion uncertainty +TT] ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

8.1.29.1 Test purpose

To verify that the Cat-M1 UE in CEModeA to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD intra-frequency cell search requirements.

8.1.29.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1.

8.1.29.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra\_UE\ cat\ M1}$ in RRC_CONNECTED state.

When no DRX is in use, the UE shall be able to identify and measure a new detectable TDD intra frequency cell according to requirements in Table 8.1.29.3-1 when SCH Ês/Iot >= -6 dB

Table 8.1.29.3-1: Requirement on cell identification delay and measurement delay for TDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	1.44 seconds	480 ms
1	2.88 seconds	960 ms

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14-1 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.29.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.21.1 and 9.1.21.2.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in TS 36.133 [4] clause 8.13.2.1.3.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra_UE cat M1 defined in TS 36.133 [4] clause 8.13.2.1.3.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra_UE cat M1 provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.3.1 and A.8.1.29.

8.1.29.4 Test description

8.1.29.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.29.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.29.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.29.4.1-1: General test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Parameter		Unit	Value	Comments
E-UTRA RF Channel Number			1	One radio channel is used for this test.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-6	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Filter coefficient			0	L3 filtering is not used
Gap Pattern Id			1	
T1		s	5	
T2		s	5	

8.1.29.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. MPDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with condition CEMode A according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.29.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.29.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 2882 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEMode A according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEMode A according to TS 36.508 [7] clause 7.2A.3AA.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEMode A and the following exceptions:

Table 8.1.29.4.3-1: Common Exception messages for E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.29.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.29.4.3-3: MeasResults: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.29.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.29.5 Test requirement

Tables 8.1.29.4.1-1 and 8.1.29.5-1 define the primary level settings including test tolerances for E-UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.29.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel as specified in clause A.7.3		R.17 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel as specified in clause A.8.3		R.15 TDD		R.15 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.60	-Infinity	-1.26
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9 MHz	-64.76	-62.34	-64.76	-62.34
Propagation Condition		ETU 30		ETU 30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Time offset to Cell 1	µs	-		3	
Note 1 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = T $_{\text{identify\_intra\_UE cat M1}}$

T $_{\text{identify\_intra\_UE cat M1}}$ = 2880 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2882 ms in this test case (note: this gives a total of 2880 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX

8.1.30.1 Test purpose

To verify that the Cat-M1 UE in CEModeA to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD intra-frequency cell search requirements in DRX requirements.

8.1.30.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support for FGI bit 5.

8.1.30.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within T$_{\text{identify_intra_UE catM1}}$ as shown in table 8.1.30.3-1.

When eDRX_CONN is in use the UE shall be able to identify a new detectable TDD intra frequency cell within T$_{\text{identify_intra_UE cat M1}}$ as shown in table 8.1.30.3-1A.

Table 8.1.30.3-1: Requirement to identify a newly detectable TDD intrafrequency cell

Gap pattern ID	DRX cycle length (s)	T$_{\text{identify_intra_UE cat M1}}$ (s) (DRX cycles)
0	≤0.04	1.44 (Note1)
	0.04<DRX-cycle≤0.08	Note2 (40)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
1	<0.128	2.88 (Note1)
	0.128	3.2 (25)
	0.128<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.30.3-1A: Requirement to identify a newly detectable TDD intrafrequency cell when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	T$_{\text{identify_intra_UE cat M1}}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (20)
NOTE: Time depends upon the eDRX_CONN cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.21.1 and 9.1.21.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.14-1 for a corresponding Band.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra\_UE\ cat\ M1}$. When DRX is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in table 8.1.30.3-2. When eDRX_CONN is used, $T_{measure\_intra\_UE\ cat\ M1}$ is as specified in table 8.1.30.3-2A. The UE shall be capable of performing RSRP measurements for 6 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra\_UE\ cat\ M1}$.

Table 8.1.30.3-2: Requirement to measure TDD intra frequency cells

Gap pattern ID	DRX cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (DRX cycles)
0	<0.128	0.48 (Note1)
	0.128≤DRX-cycle≤2.56	Note2 (5)
1	<0.256	0.96 (Note1)
	0.256≤DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use		

Table 8.1.30.3-2A: Requirement to measure TDD intra frequency cells when eDRX_CONN cycle is used

eDRX_CONN cycle length (s)	$T_{measure\_intra\_UE\ cat\ M1}$ (s) (eDRX_CONN cycles)
2.56<eDRX_CONN cycle≤10.24	Note (5)
NOTE: Time depends upon the eDRX_CONN cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.21.1 and 9.1.21.2.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.21.1 and 9.1.21.2.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_UE\ cat\ M1}$ defined in TS 36.133 [4] clause 8.13.2.1.3.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in TS 36.133 [4] clause 8.13.2.1.3.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.2.1.3.2 and A.8.1.30.

8.1.30.4 Test description

8.1.30.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.30.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.30.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.30.4.1-1: General test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used

Parameter		Unit	Value		Comments
			Test 1	Test 2	
E-UTRA RF Channel Number			1		One radio channel is used for both tests.
Active cell			Cell 1		
Neighbour cell			Cell 2		Cell to be identified.
CP length			Normal		
DRX			ON		DRX related parameters are defined in Table 8.1.30.5-2
A3	Offset	dB	-6		
	Hysteresis	dB	0		
	Time To Trigger	s	0		
Special subframe configuration			6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1		As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Filter coefficient			0		L3 filtering is not used
Gap Pattern Id			0		
T1		s	5		
T2		s	5	30	

8.1.30.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.30.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.

3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.1.30.5-1 and 8.1.30.5-2.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1482 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeA according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA),

   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.
11. Repeat steps 1-10 for each sub-test Table 8.1.30.4.1-1 as appropriate.

8.1.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 8.1.30.4.3-1: Common Exception messages for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.1.30.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.1.30.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.30.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.1.30.4.3-5: MeasResults: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.30.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA when DRX is used test requirements

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.1.30.5 Test requirement

Tables 8.1.30.4.1-1, 8.1.30.5-1, 8.1.30.5-2 and 8.1.30.5-3 define the primary level settings including test tolerances for E-UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells tests when DRX is used.

Table 8.1.30.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used for Cat-M1 UE in CEModeA

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel as specified in clause A.7.3		R.17 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel as specified in clause A.8.3		R.15 TDD		R.15 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4.2
$\hat{E}_s/I_{ot}$ Note 3	dB	4	-1.60	-Infinity	-1.26
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-93.8
Io Note 3	dBm/9 MHz	-64.76	-62.34	-64.76	-62.34
Propagation Condition		ETU 30		ETU 30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Time offset to Cell 1	µs	-		3	

Note 1 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Table 8.1.30.5-2: DRX-Configuration for E-UTRAN TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.30.5-3: *TimeAlignmentTimer-Configuration* for E-UTRAN TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	2	For further information see clause 6.3.2 in TS 36.331 and clause 10.1 in TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 1440 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 1440 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 1482 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra\_UE\ cat\ M1}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.31 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Cell specific test parameters in Table 8.1.31.5-1is need clarification by RAN4 with LS R5-169159.*
- *Test procedure and requirement is still FFS.*

8.1.31.1 Test purpose

To verify the Cat-M1 UE in CEModeB to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.31.2 Test applicability

This test applies to all types of E-UTRA FDD UE Release 13 and forward of UE category M1. Applicability requires support CEMode B.

8.1.31.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.31.3-1 provided that additional conditions table 8.1.31.3-2 is met.

Table 8.1.31.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.31.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for FDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.31.3-1	As defined in table 8.1.31.3-1
-15≤Q1<-6	Q2≥-6	Requirements in table 8.1.23.3-1 apply	Requirements in table 8.1.23.3-1 apply
Q1≥ -6	Q2≥-6	Requirements in table 8.1.23.3-1 apply	Requirements in table 8.1.23.3-1 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS36.101 [4] Sections 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS36.101 [4] Annex Table B.2.14-3 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.31.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

The RSRP measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.21.3 and 9.1.21.4.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS36.101 [4] sections 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in TS36.101 [4] Clause 8.13.3.1.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in TS36.101 [4] clause 8.13.3.1.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_UE\ cat\ M1}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.1.1 and A.8.1.31.

8.1.31.4 Test description

8.1.31.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15 using only main UE Tx/Rx antenna.

2. The general test parameter settings are set up according to Table 8.1.31.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.31.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.31.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	325	

8.1.31.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.31.5-1. Propagation conditions are set according to Annex B clauses B.1 and B.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.31.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than [320802 ms] then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.31.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.31.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.31.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.31.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.31.5 Test requirement

Tables 8.1.31.4.1-1 and 8.1.31.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.31.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.4		R.22 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.4		R.18 FDD		R.18 FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98 + TT			
$\hat{E}_s/N_{oc}$	dB	-12 + TT	-12 + TT	-Infinity	-12 + TT
$\hat{E}_s/I_{ot}$ Note 3	dB	-12 + TT	-12.27 + TT	-Infinity	-12.27 + TT
RSRP Note 3	dBm/15 KHz	-110 + TT	-110 + TT	-Infinity	-110 + TT
SCH_RP Note 3	dBm/15 KHz	-110 + TT	-110 + TT	-Infinity	-110 + TT
Io Note 3	dBm/9MHz	-69.95 + TT	-69.70 + TT	Specified in Cell 1 columns	
Propagation Condition		ETU70		ETU70	
Antenna Configuration		[1x1]		[1x1]	
Timing offset to Cell 1	ms	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1} + T_{measure\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 320800 ms

$T_{measure\_intra\_UE\ cat\ M1}$ = 800 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of [321602 ms] in this test case (note: this gives a total of 321600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.32 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Cell specific test parameters in Table 8.1.31.5-1is need clarification by RAN4 with LS R5-169159.*
- *Test requirement is still FFS.*

8.1.32.1 Test purpose

To verify the Cat-M1 UE in CEModeB to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.1.32.2 Test applicability

This test applies to all types of E-UTRA FDD UE Release 13 and forward of UE category M1. Applicability requires support CEMode B.

8.1.32.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.1.31.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.1.1 and A.8.1.32.

8.1.32.4 Test description

8.1.32.4.1 Initial conditions

Same initial conditions as in clause 8.1.31.4.1 with following exceptions:

- Instead of Table 8.1.31.4.1-1 → use Table 8.1.32.4.1-1.

Table 8.1.32.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	325	

8.1.32.4.2 Test procedure

Same test procedure as in clause 8.1.31.4.2 with following exceptions:

- Instead of Table 8.1.31.5-1 → use Table 8.1.32.5-1.

8.1.32.4.3 Message contents

Same message contents as in clause 8.1.31.4.3.

8.1.32.5 Test requirement

Tables 8.1.32.4.1-1 and 8.1.32.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.32.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel defined in clause A.8.4		R.22 FDD		-	
MPDCCH parameters: DL Reference Measurement Channel defined in clause A.7.4		R.18 FDD		R.18 FDD	
OCNG Patterns defined in clause D.1		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98 + TT			
$\hat{E}_s/N_{oc}$	dB	-12 + TT	-12 + TT	-Infinity	-12 + TT
$\hat{E}_s/I_{ot}$ Note 3	dB	-12 + TT	-12.27 + TT	-Infinity	-12.27 + TT
RSRP Note 3	dBm/15 KHz	-110 + TT	-110 + TT	-Infinity	-110 + TT
SCH_RP Note 3	dBm/15 KHz	-110 + TT	-110 + TT	-Infinity	-110 + TT
Io Note 3	dBm/9MHz	-69.95 + TT	-69.70 + TT	Specified in Cell 1 columns	
Propagation Condition		ETU70		ETU70	
Antenna Configuration		[1x1]		[1x1]	
Timing offset to Cell 1	µs	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1} + T_{measure\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 320800 ms

$T_{measure\_intra\_UE\ cat\ M1}$ = 800 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of [321602 ms] in this test case (note: this gives a total of 321600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.31 to 8.1.32

8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB

8.1.33.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.33.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that support CE Mode B.

8.1.33.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.33.3-1 provided that additional conditions table 8.1.33.3-2 is met.

Table 8.1.33.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.33.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for FDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.33.3-1	As defined in table 8.1.33.3-1
-15≤Q1<-6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-4 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.33.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.33.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.33.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.2.1 and A.8.1.33.

8.1.33.4 Test description

8.1.33.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.33.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.33.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.33.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used for this test
Active Cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	≤325	

8.1.33.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.33.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.33.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3210 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.1.33.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.33.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.33.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.33.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.33.5 Test requirement

Tables 8.1.33.4.1-1 and 8.1.33.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells.

Table A.8.1.33.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.13 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.9 HD-FDD		R.9 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	-11.20	-10.80	-infinity	-10.80
$\hat{E}_s/I_{ot}$ Note 3	dB	-11.20	-11.15	-infinity	-11.15
RSRP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
SCH_RP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 3208

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 3210 ms in this test case (note: this gives a total of 3208 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

8.1.34.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA HD-FDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.34.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that support CE Mode B.

8.1.34.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable FDD intra frequency cell according to requirements in Table 8.1.34.3-1 provided that additional conditions table 8.1.34.3-2 is met.

Table 8.1.34.3-1: Requirement on cell identification delay and measurement delay for FDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.34.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for FDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.34.3-1	As defined in table 8.1.34.3-1
-15≤Q1<-6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-4 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.34.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra\_UE\ cat\ M1}$ defined in Clause 8.1.34.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_UE\ cat\ M1}$ defined in Clause 8.1.34.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_UE\ cat\ M1,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.2.1 and A.8.1.34.

8.1.34.4 Test description

8.1.34.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.34.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.34.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.34.4.1-1: General test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1	One radio channel is used for this test
Active Cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Filter coefficient			0	L3 filtering is not used
Gap pattern ID			0	
T1		s	5	
T2		s	≤325	

8.1.34.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.34.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.34.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3210 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.1.34.4.3-1: Common Exception messages for E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.34.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.34.4.3-3: *MeasResults*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.34.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN HD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.34.5 Test requirement

Tables 8.1.34.4.1-1 and 8.1.34.5-1 define the primary level settings including test tolerances for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table A.8.1.34.5-1: Cell specific test parameters for E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.13 HD-FDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.9 HD-FDD		R.9 HD-FDD	
OCNG Patterns		OP.21 FDD		OP.2 FDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	-11.20	-10.80	-infinity	-10.80
$\hat{E}_s/I_{ot}$ Note 3	dB	-11.20	-11.15	-infinity	-11.15
RSRP Note 3	dBm/15 KHz	-109.20	-108.80	-infinity	-108.80
SCH_RP Note 3	dBm/15 KHz	-109.20	-108.80	-infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	µs	-		3	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 3208

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 3210 ms in this test case (note: this gives a total of 3208 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

8.1.35.1 Test purpose

To verify Cat-M1 UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD intra-frequency cell search requirements for Cat-M1 UE.

8.1.35.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 that support CE Mode B.

8.1.35.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify and measure a new detectable TDD intra frequency cell according to requirements in Table 8.1.35.3-1provided that additional conditions Table 8.1.35.3-2 is met.

Table 8.1.35.3-1: Requirement on cell identification delay and measurement delay for TDD intrafrequency cell

Gap pattern ID	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
0	320.8 s	800 ms
1	321.6 s	1600ms

Table 8.1.35.3-2: Conditions on SCH Ês/Iot for cell identification delay and measurement delay for TDD intrafrequency cell

SCH Ês/Iot of already identified cell including serving cell: Q1	Neighbouring cell SCH Ês/Iot: Q2	Cell identification delay ($T_{identify\_intra\_UE\ cat\ M1}$)	Measurement delay ($T_{measure\_intra\_UE\ cat\ M1}$)
-15≤Q1<-6	-15≤ Q2 < -6	As defined in table 8.1.35.3-1	As defined in table 8.1.35.3-1
-15≤Q1<-6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply
Q1≥ -6	Q2≥-6	Requirements in TS 36.133 [4] Clauses 8.13.2 apply	Requirements in TS 36.133 [4] Clauses 8.13.2 apply

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4 are fulfilled for a corresponding Band,

- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Table B.2.14-3 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_UE\ cat\ M1}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is according to Table 8.1.35.3-1. When measurement gaps are activated the UE shall be capable of performing measurements for at least 6 cells. If the UE has identified more than 6 cells, the UE shall perform measurements but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

Reported RSRP measurement contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] Clauses 9.1.21.3 and 9.1.21.4.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify intra\_UE cat M1}}$ defined in Clause 8.1.35.3. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra\_UE cat M1}}$ defined in Clause 8.1.35.3 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period\_UE cat M1, Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.3.1 and A.8.1.35.

8.1.35.4 Test description

8.1.35.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (Node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15 using only main UE Tx/Rx antenna.
2. The general test parameter settings are set up according to Table 8.1.35.4.1-1.
3. Propagation conditions are set according to Annex B.0.
4. Message contents are defined in clause 8.1.35.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.35.4.1-1: General test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Parameter		Unit	Value	Comments
E-UTRA RF Channel Number			1	One radio channel is used for this test.
Active cell			Cell 1	
Neighbour cell			Cell 2	Cell to be identified.
CP length			Normal	
DRX			OFF	
A3	Offset	dB	-8	
	Hysteresis	dB	0	
	Time To Trigger	s	0	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211[9]. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211[9]. The same configuration in both cells
Filter coefficient			0	L3 filtering is not used
Gap Pattern Id			0	
T1		s	5	
T2		s	≤325	

8.1.35.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.35.5-1. Propagation conditions are set according to Annex B.1 and B.2. T1 starts.
3. The SS shall transmit the RRCConnectionReconfiguration message.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.35.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3210 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit the RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A-CE with the condition CEModeB according to TS 36.508 [7] clause 4.5.3AB (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8.1.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 8.1.35.4.3-1: Common Exception messages for E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2a Table H.3.1-7

Table 8.1.35.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-16 (-8 dB)	-8 is actual value in dB (-16 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.1.35.4.3-3: *MeasResults*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.35.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.35.5 Test requirement

Tables 8.1.35.4.1-1 and 8.1.35.5-1 define the primary level settings including test tolerances for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells.

Table 8.1.35.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1			
$BW_{channel}$	MHz	10			
PDSCH parameters: DL Reference Measurement Channel		R.19 TDD		-	
MPDCCH parameters: DL Reference Measurement Channel		R.17 TDD		R.17 TDD	
OCNG Patterns		OP.11 TDD		OP.2 TDD	
PBCH_RA	dB	-3		-3	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
MPDCCH_RA	dB				
MPDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	-11.20	-10.80	-infinity	-10.80
$\hat{E}_s/I_{ot}$ Note 3	dB	-11.20	-11.15	-infinity	-11.15
RSRP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
SCH_RP Note 3	dBm/15 kHz	-109.20	-108.80	-infinity	-108.80
Io Note 3	dBm/9MHz	-69.90	-69.55	Specified in Cell 1 columns	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		2x1 Low		2x1 Low	
Timing offset to Cell 1	ms	-		3	
Note 1 OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: $\hat{E}_s/I_{ot}$, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_UE\ cat\ M1}$

$T_{identify\_intra\_UE\ cat\ M1}$ = 3208

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 3210 ms in this test case (note: this gives a total of 3208 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.36 E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances, Test system uncertainties and test requirement values
- Annex E needs to be updated
- Message content is TBD
- The test requirement is within brackets

8.1.36.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps for Cat-M1 UE in CEModeB.

8.1.36.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward with supports CEModeB and intra-frequency SI acquisition for HO.

8.1.36.3 Minimum conformance requirements

The requirements defined in TS36.133[4] subclause 8.13.3.1.4 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_Cat\,M1,\,intra} = T_{basic\_identify\_CGI\_Cat\,M1,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$ = [5120] ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_Cat\ M1,.intra}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{identify\_CGI\_Cat\ M1,\ intra}$ ms , over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.13.3.1.4.1-1.

Table 8.13.3.1.4.1-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$.

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.4 and A.8.1.36.

8.1.36.4 Test description

8.1.36.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.1.36.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.36.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.36.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
CP length		Normal	
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤ 325	
T3	s	7	

8.1.36.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.36.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.36.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within [5137] milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than [5137] ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

8.1.36.5 Test requirement

Tables 8.1.36.4.1-1 and 8.1.36.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB test.

Table 8.1.36.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Channel in clause A.8.4		R.23 FDD			N/A		
MPDCCH Reference Channel in clause A.7.4		R.19 FDD			N/A		
OCNG Patterns defined in D.1 (OP.21 FDD) and (OP.2 FDD)		OP.21 FDD			OP.2 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
MPDCCH_RA	dB	0			0		
MPDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s/N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity	-3+TT	-3+TT
$\hat{E}_s/I_{ot}$		8+TT	6.24+TT	6.24+TT	-Infinity	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
PBCH repetition level					20		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5137 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_Cat\ M1,\ intra}$ + reporting delay

= 15 + [5120] + 2ms from the start of T3

= [5137] ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.1.37 E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for Cat-M1 UE in CEModeB

Editor's notes: This test case is incomplete. The following items are missing or incomplete:

- Test tolerances, Test system uncertainties and test requirement values
- Annex E needs to be updated
- Message content is TBD
- The test requirement is within brackets and needs an update in 36.133

8.1.37.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX for Cat-M1 UE in CEModeB.

8.1.37.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward with supports CEModeB, DRX and intra-frequency SI acquisition for HO.

8.1.37.3 Minimum conformance requirements

The requirements defined in TS36.133[4] subclause 8.13.3.1.4 apply provided the following condition is met:

- Tx diversity or transmission using multiple antennas are supported in the target cell to be detected.
- Repetitions of MIB/SIB1bis are supported in the target cell to be detected.

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1bis message according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX or eDRX_CONN is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI\_Cat M1, intra}} = T_{\text{basic\_identify\_CGI\_Cat M1, intra}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI\_Cat M1, intra}}$ = [5120] ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.14 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI\_Cat M1,.intra}}$ is applicable when no DRX is used as well as when any of DRX and eDRX_CONN cycles specified in TS 36.331 [2] is used.

Within the time, $T_{\text{identify\_CGI\_Cat M1, intra}}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the PBCH repetition and SIB1-BR repetition level in the target cell shall be as specified in Table 8.13.3.1.4.1-1.

Table 8.13.3.1.4.1-1: Conditions in target cell during $T_{basic\_identify\_CGI\_Cat\ M1,\ intra}$.

Target cell		
Ês/Iot [dB]	PBCH repetition	SIB1-BR repetition level
≥ -15	Configured as specified in TS 36.211 [16]	16

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. In case eDRX_CONN is used, the ECGI reporting may be delayed until the next eDRX_CONN cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.13.3.1.4 and A.8.1.37.

8.1.37.4 Test description

8.1.37.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. The general test parameter settings are set up according to Table 8.1.37.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.37.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.37.4.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
CP length		Normal	
A3-Offset	dB	-16	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤ 325	
T3	s	7	

8.1.37.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on NPUSCH.

1. Ensure the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to T1 in Table 8.1.37.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.37.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within [5120] milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than [5120] ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.
11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.37.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

TBD

8.1.37.5 Test requirement

Tables 8.1.37.4.1-1 and 8.1.37.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB test.

Table 8.1.37.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for Cat-M1 UE in CEModeB

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1					
$BW_{channel}$	MHz	10					
PDSCH Reference Channel in clause A.8.4		R.23 FDD			N/A		
MPDCCH Reference Channel in clause A.7.4		R.19 FDD			N/A		
OCNG Patterns defined in D.1 (OP.21 FDD) and (OP.2 FDD)		OP.21 FDD			OP.2 FDD		
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB	-3			-3		
PHICH_PB	dB						
MPDCCH_RA	dB	0			0		
MPDCCH_PB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-98+TT					
$\hat{E}_s/N_{oc}$	dB	8+TT	8+TT	8+TT	-Infinity	-3+TT	-3+TT
$\hat{E}_s/I_{ot}$		8+TT	6.24+TT	6.24+TT	-Infinity	-11.64+TT	-11.64+TT
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-101	-101
Io Note 3	dBm/9MHz	-61.58	-61.29	-61.29	Specified in columns for Cell 1		
Propagation Condition		AWGN			AWGN		
Antenna Configuration		2x1			2x1		
Timing offset to Cell 1	ms	-			3		
PBCH repetition level					20		
SIB1-BR repetition level		-			16		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.37.5-2: DRX configuration for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for Cat-M1 UE in CEModeB

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.1.37.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for Cat-M1 UE in CeModeB

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 5120 ms from the start of T3.

Test requirement = RRC Procedure delay + $T_{\text{identify\_CGI\_Cat M1, intra}}$ + reporting delay

= 15 + [5120] + 2ms from the start of T3

= [5120] ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.2 E-UTRAN TDD intra frequency measurements

8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.2.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra frequency cell search requirements.

8.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.2.1.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$T_{\text{identify intra}} = T_{\text{basic identify } E-UTRA\_\text{TDD, intra}} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}} \quad ms$$

where

$T_{\text{basic\_identify\_E-UTRA\_TDD, intra}}$ is 800 ms

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Section 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathrm{Y}_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement TDD}} \cdot \frac{\mathrm{T}_{\text{Intra}}}{\mathrm{T}_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

where

$X_{basic\ measurement\ TDD}$ = 8 (cells)

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency RSRP and RSRQ measurements.

T_{Intra}: This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2.1 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2 and A.8.1.2.

8.2.1.4 Test description

8.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.2.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.1.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.1.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.2.1.5-2
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	5	

8.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions shall be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.1.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.2.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.1.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.1.5 Test requirement

Tables 8.2.1.4.1-1, 8.2.1.5-1, and 8.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.2.1.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in A.2.1 (OP.1 TDD) and in A.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.2.1.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	psf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{\text{identify\_intra}} = T_{\text{basic identify } E-UTRA\_\text{TDD, intra}} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}}$$

$T_{\text{basic\_identify\_E-UTRA\_TDD, intra}}$= 800 ms

$T_{\text{Measurement\_Period,Intra}}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

8.2.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 5.

8.2.2.3 Minimum conformance requirements

Note: The state when no DRX is used is assumed to be the one in which the DRX Inactivity Timer is running, and the state when DRX is used is assumed to be otherwise for this performance requirement.

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{\text{identify\_intra}}$ as shown in table 8.2.2.3-1

Table 8.2.2.3-1: Requirement to identify a newly detectable TDD intra frequency cell

DRX cycle length (s)	$T_{\text{identify\_intra}}$ (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.08<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Sections 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in Section 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band.

In the RRC_CONNECTED state with DRX cycles of 80ms or greater the measurement period for intra frequency measurements is $T_{\text{measure\_intra}}$ as shown in table 8.2.2.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for TS 45.008 [15] identified-intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.2.2.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04<DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2 and A.8.2.2.

8.2.2.4 Test description

8.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.2.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.2.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.2.2.4-2
Time offset between cells	µs	3		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.2.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 842 ms for Test 1 and 26882 ms for Test 2 then the number of

successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.2.2.4.1-1 as appropriate.

8.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.2.2.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.2.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.2.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.2.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.2.5 Test requirement

Tables 8.2.2.5-1, 8.2.2.5-2 and 8.2.2.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.2.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
SCH_RP Note 3	dBm/15 kHz	-91.40	-91.40	-Infinity	-91.40
$\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.2.2.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	Sf40	sf1280	
shortDRX	disable	disable	

Table 8.2.2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 800 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 842 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.3 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.2.3.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in TS 36.133 [4] section 8.1.2.2.4.

8.2.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of intra-frequency SI acquisition for HO.

8.2.3.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose ‘reportCGI’. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,\,intra} = T_{basic\_identify\_CGI,\,intra} \quad ms$$

Where

$T_{basic\_identify\_CGI,\ intra}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.3.3-1 during the identification of a new CGI of E-UTRA cell.

Table 8.2.3.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI, intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0	18
1	35
2	43
3	36
4	39
5	42
6	30

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.4 and A.8.2.3.

8.2.3.4 Test description

8.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.2.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.3.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.3.4.1-1: General test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.2.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.3.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose reportCGI and si-RequestForHO set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 47 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 47 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE

fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 47 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.3.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.3.4.3-3: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.3.4.3-5: ReportConfigEUTRA-PERIODICAL: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.3.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.3.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step 7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.3.4.3-9: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.3.5 Test requirement

Tables 8.2.3.4.1-1 and 8.2.3.5-1 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.33	-3.33	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, intra} = T_{basic\_identify\_CGI, intra} \quad ms$$

$T_{basic\_identify\_CGI, intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 47 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 47 ACK/NACK number is caused by two parts. Firstly, at least 35 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.2.3.3-1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.2.4 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.2.4.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX.

8.2.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of intra-frequency SI acquisition for HO. Applicability requires support for FGI bit 5

8.2.4.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$\mathrm{T}_{\mathrm{identify\_CGI,\,intra}} = \mathrm{T}_{\mathrm{basic\_identify\_CGI,\,intra}} \quad ms$$

Where

$T_{basic\_identify\_CGI,\ intra}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.2 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,.intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.4 and A.8.2.4.

8.2.4.4 Test description

8.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 8.2.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.4.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.4.4.1-1: General test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.2.4.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.2.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.2.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.4.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.4.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.4.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.2.4.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.2.4.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.2.4.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.4.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.4.4.3-7: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.4.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.4.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.4.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.4.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.4.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.4.4.3-13: *MeasResults*: Additional E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.4.5 Test requirement

Tables 8.2.4.4.1-1, 8.2.4.5-1, 8.2.4.5-2 and 8.2.4.5-3 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used test.

Table 8.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.33	-3.33	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 8.2.4.5-2: DRX configuration for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.4.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8]

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, intra}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, intra} = T_{basic\_identify\_CGI, intra} \quad ms$$

$T_{basic\_identify\_CGI, intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.5 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

8.2.5.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction and non-MBSFN ABS configured in the aggressor cell.

8.2.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

8.2.5.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable TDD intra-frequency cell within

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC, intra} \cdot \frac{T_{Measurement\_Period\_eICIC, Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC, intra}$ is 1000 ms.

T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.3 and 9.1.2.4 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.2 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex B.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_eICIC, Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells , including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_eICIC}$ cells , where $Y_{measurement\_intra\_eICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_eICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{measurement\_intra\_eICIC} = Floor\left\{ X_{basic\_measurement\_TDD\_eICIC} \cdot \frac{T_{Intra}}{T_{Measurement\_Period\_eICIC, Intra}} \right\} \text{ cells}$$

where

$X_{basic\_measurement\_TDD\_eICIC}$ = 8 (cells)

$T_{Measurement\_Period\_eICIC, Intra}$ = 200 ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_eICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_eICIC}$ defined above becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra\_eICIC}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.2 and A.8.2.5.

8.2.5.4 Test description

8.2.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.15.

2. The general test parameter settings are set up according to Table 8.2.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.5.4.3.

5. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.2.5.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
PCell		Cell 1	Also the aggressor cell. Active in T1 and T2
Neighbour cell		Cell 2	Cell to be identified. Active only in T2.
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-11	
Event A3 measurement quantity		RSRP	
CP length		Normal	
Special subframe configuration		6	As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
T1	s	5	
T2	s	5	
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 != 0	Cell PCIs are selected so that the condition is met
ABS pattern		'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1 during T1. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331, clause 6.3.5. Configured during T1 for Cell 2 measurements.
Time domain measurement resource restriction pattern for PCell measurements		'10000000001000000000'	Configured during T1 for Cell 1 measurements

8.2.5.4.2 Test procedure

There are two synchronous E-UTRA cells in the test on the same RF channel. Cell 1 is the Pcell and also the aggressor cell, Cell 2 is the neighbour victim cell to be identified. Non-MBSFN ABS pattern is configured for aggressor cell (Cell 1). The UE is configured with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells (Cell 2). The UE is also configured with a time domain measurement resource restriction pattern for PCell (Cell 1) measurements. It is indicated to the UE that event-triggered reporting with Event A3 is used.

The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 2. The information for both measurement patterns shall be provided to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters for both Cell 1 and Cell 2 according to T1 in Table 8.2.5.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.5.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.5.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.5.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-22 (-11 dB)	-11 is actual value in dB (-22 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.5.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.5.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.2.5.4.3-5: MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	Cell1
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 8.2.5.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with Non-MBSFN ABS (eICIC)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

8.2.5.5 Test requirements

Table 8.2.5.5-1: Cell specific test requirement parameters for E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
$(\hat{E}_s / N_{oc})_{meas}$ Note 5	dB	1	1	-Infinity	-3.2
$(\hat{E}_s / N_{oc})_{ABS}$	dB	1	1	N/A	N/A
RSRP Note 4,5	dBm/15 kHz	-97	-97	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-97	-97	-Infinity	-101.2
CRS $\hat{E}_s / I_{ot}$	dB	1	-0.7	-Infinity	-6.74
SCH $\hat{E}_s / I_{ot}$	dB	1	0.7	-Infinity	-3.2
Propagation Condition		ETU30			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSPP is estimated for Cell 2 during the restricted measurement subframes for neighbour cells. RSPP is estimated for Cell 1 during the PCell restricted subframes.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_eICIC}$

$$T_{identify\_intra\_eICIC} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC, intra} \cdot \frac{T_{Measurement\_Period\_eICIC, Intra}}{T_{Intra}} \quad ms$$

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC,\ intra}$ = 1000 ms

$T_{Measurement\_Period\_eICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

8.2.6.1 Test purpose

To verify that the UE correctly detects and reports Event A3 (neighbour becomes offset better than PCell) defined in [5] under a time domain measurement resource restriction pattern and CRS assistance information, and when non-MBSFN ABS configured in the interfering cells.

8.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

8.2.6.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD intra-frequency cell within

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_FeICIC, intra} \cdot \frac{T_{Measurement\_Period\_FeICIC, Intra}}{T_{Intra}} \quad ms$$

where

- $T_{basic\_identify\_E\text{-}UTRA\_TDD\_eICIC,\ intra}$ is 1000 ms.
- T_{Intra} is the minimum time available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. The time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when:

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.5 and 9.1.2.6 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.8 for a corresponding Band.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period_FeICIC,\ Intr}$a. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells , including also the cells which are not measured in the subframes indicated by the time-domain measurement resource restriction pattern and the cells indicated in the CRS assistance information, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\_intra\_FeICIC}$ cells , where $Y_{measurement\_intra\_FeICIC}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\_intra\_FeICIC}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement\_intra\_FeICIC}} = Floor\left\{ X_{\text{basic\_measurement\_TDD\_FeICIC}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period\_FeICIC, Intra}}} \right\} \text{ cells}$$

where

- $X_{basic\_measurement\_TDD\_FeICIC}$ = 8 (cells)
- $T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200ms is the measurement period for intra-frequency RSRP and RSRQ measurements.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FeICIC}$ defined above. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FeICIC}$ defined above becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_FeICIC,\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.8.4 and A.8.2.6.

8.2.6.4 Test description

8.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.54.
2. The general test parameter settings are set up according to Table 8.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.6.4.3.
5. In this test, there are three E-UTRA cells, Cell 1, Cell 2 and Cell 3, all on same frequencies. At this stage only Cell 1 is switched on. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1.

Table 8.2.6.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
PCell			Cell 1	Also a first interfering cell to Cell 3. Active in T1 and T2.
Neighbour cells			Cell 2 and Cell 3	Cell 2 is a second interfering cell; Cell 2 is active in T1 and T2. Cell 3 is the cell to be identified; Cell 3 is active only in T2.
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
E-UTRA RF Channel Number			1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)		MHz	10	For all cells in the test
A3-Offset		dB	-14	
Event A3 measurement quantity			RSRP	
CP length			Normal	
Special subframe configuration			6	As specified in Table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis		dB	0	
Time To Trigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
Time offset between cells		µs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
T1		s	5	
T2		s	5	
Physical cell IDs			$(PCI_{cell1} - PCI_{cell3})mod6 = 0$ $(PCI_{cell2} - PCI_{cell3})mod6 != 0$ PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2 during T1.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE during T1 for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time domain measurement resource restriction pattern for PCell measurements			'10000000001000000000'	Configured during T1 for Cell 1 measurements
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig
	antennaPortsCount		1	

	mbsfn-SubframeConfigList		*oneFrame* = '000000'	element with subframe allocation *one Frame*='000000'.

8.2.6.4.2 Test procedure

The test parameters are given in Tables 8.2.6.4.1-1 and 8.2.6.51-1. It is indicated to the UE in the measurement control information that event-triggered reporting with Event A3 is used. In the test, there are three synchronous cells, Cell 1, Cell 2, and Cell 3, on the same RF channel. Cell 1 is the PCell. Cell 3 is the cell to be identified. A non-MBSFN ABS pattern is configured in each of the Cell 1 and Cell 2 during the entire test. The test consists of two successive time periods with time duration of T1 and T2, respectively. During time duration T1, the UE shall not have any timing information on Cell 3.

The UE is configured by higher layers with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements. The UE is also provided via higher layers with the CRS assistance information for Cell 2. The information for both measurement patterns and the CRS assistance information shall be provided via RRC to the UE during T1.

1. Ensure the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters for Cell 1 and Cell 2 according to T1 in Table 8.2.6.5-1. Propagation conditions are set according to Annex B clause B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 for Cell 1, Cell 2, and Cell 3 as specified in Table 8.2.6.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1002 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Formulas are applied until PCI-s values are found, which fulfill the PCI conditions described in Table 8.2.6.4.1-1.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A in Cell 1 according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF in Cell 1 according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 5.2A.5.1 with the following exceptions:

Table 8.2.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 8.2.6.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-28 (-14 dB)	-14 is actual value in dB (-28 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
maxReportCells	2		
}			

Table 8.2.6.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.6.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
physCellId	PhysCellId of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.6.4.3-5: MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	Cell1
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

Table 8.2.6.4.3-6: *RadioResourceConfigDedicated-SRB2-DRB:* Additional E-UTRAN TDD-TDD intra-frequency event-triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10			
subframeConfig1-5-r10	‘10000000001000000000’	BIT STRING (SIZE (20))	
}			
}			
}			

8.2.6.5 Test requirements

Tables 8.2.6.4.1-1 and 8.2.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS test.

Table 8.2.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		1		1	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2.TDD		N/A	OP.2 TDD
PBCH_RA	dB	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.		N/A	0
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
$(\hat{E}_s / N_{oc})$	dB	4	4	2	2	-Infinity	-3.20
RSRP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
SCH_RP Note 4	dBm/15 kHz	-94	-94	-96	-96	-Infinity	-101.2
CRS $\hat{E}_s/I_{ot}$ Note 5	dB	4	2.30	2	0.30	-Infinity	-8.66
SCH $\hat{E}_s/I_{ot}$	dB	-0.12	-0.86	-3.45	-4.01	-Infinity	-10.27
Propagation Condition		ETU30		ETU30		ETU30	

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
NOTE 4: RSRP, SCH_RP, and $\hat{E}_s/I_{ot}$ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: Applies during the restricted measurement subframes configured for neighbour cell (Cell 3) measurements.

The UE shall send one Event A3 triggered measurement report for Cell 3, with a measurement reporting delay less than 1000 ms from the beginning of time period T2.

The UE shall not send event-triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% for the tested Event A3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra\_FeICIC}$

$$T_{identify\_intra\_FeICIC} = T_{basic\_identify\_E\text{-}UTRA\_TDD\_FeICIC,\ intra} \cdot \frac{T_{Measurement\_Period\_FeICIC,\ Intra}}{T_{Intra}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_TDD\_FeICIC,\ intra}$ is 1000 ms.

$T_{Measurement\_Period\_FeICIC,\ Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1002 ms in this test case (note: this gives a total of 1000 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0

8.2.7.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.2.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward with support of intra-frequency SI acquisition for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.2.7.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI\_LC\text{-}UE,\ intra} = T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra} \quad ms$$

Where

$T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.2 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI\_LC\text{-}UE,\ intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $\mathrm{T}_{\mathrm{identify\_CGI\_LC\text{-}UE,\,intra}}\ ms$, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.7.3-1 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.2.7.3-1: Requirement on minimum number of ACK/NACKs to transmit during $\mathrm{T}_{\mathrm{basic\_identify\_CGI\_LC\text{-}UE,\,intra}}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0 (Note 1)	30
1	54
2	68
3	56
4	61
5	66
6	46
Note 1: The applicability of this requirement is TBD.	

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.6 and A.8.2.7.

8.2.7.4 Test description

8.2.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).
2. The general test parameter settings are set up according to Table 8.2.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.7.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.7.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤10	
T3	s	5	

8.2.7.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.7.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.7.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.2.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.7.4.3-3: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.7.4.3-5: ReportConfigEUTRA-PERIODICAL: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.7.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.7.4.3-7: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.7.4.3-8: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step 7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.7.4.3-9: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.7.5 Test requirement

Table 8.2.7.4.1-1 and A.8.2.7.5.1-1 define the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps.

Table 8.2.7.5.1-1: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	μs	-			3		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 190 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_LC\text{-}UE,\ intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 190 ms at least 66 ACK/NACK shall be detected as being transmitted by the UE.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The overall 66 ACK/NACK number is caused by two parts. Firstly, at least 54 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.1.2.2.4.1-1 of Clause 8.1.2.2.4.1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 210 ms excludes 190 ms for identifying the cell global identifier o

8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0

8.2.8.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.2.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward with support of intra-frequency SI acquisition for HO. Applicability requires support for FGI bit 5 of UE category 0.

8.2.8.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to clause 5.5.3.1 of TS 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, or whether SCell(s) are configured or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI\_LC-UE, intra}} = T_{\text{basic\_identify\_CGI\_LC-UE, intra}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI\_LC-UE, intra}}$ = 190 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2.2 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to [TBD].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI\_LC-UE, intra}}$ is applicable when no DRX is used as well as when all the DRX cycles specified in TS 36.331 [2] are used.

Within the time, $T_{\text{identify\_CGI\_LC-UE, intra}}$ ms, over which the UE identifies the new CGI of E-UTRA cell, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.2.8.3-1 on PCell provided that:

- there is continuous DL data allocation,
- no DRX cycle is used,
- no measurement gaps are configured,
- only one code word is transmitted in each subframe,
- no MBSFN subframes are configured in the PCell or each of activated SCell(s).

Table 8.2.8.3-1: Requirement on minimum number of ACK/NACKs to transmit during $T_{basic\_identify\_CGI\_LC-UE,\ intra}$

UL/DL configuration	Minimum number of transmitted ACK/NACKs
0 (Note 1)	30
1	54
2	68
3	56
4	61
5	66
6	46
Note 1: The applicability of this requirement is TBD.	

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle. If IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.5.2.1.6 and A.8.2.8.

8.2.8.4 Test description

8.2.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20(using only main UE Tx/Rx antenna).

2. The general test parameter settings are set up according to Table 8.2.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.2.8.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.8.4.1-1: General test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.13 TDD	As specified in clause A.3.1.1.5
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.7 TDD	As specified in clause A.3.1.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.2.8.1-3
si-RequestForHO		TRUE	As specified in clause 5.5.3.1 in TS 36.331.
T1	s	5	
T2	s	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.2.8.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.2.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.8.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

8. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

9. The UE shall transmit RRCConnectionReconfigurationComplete message.

10. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 210 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 210 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.

11. After the SS receive the MeasurementReport message in step 10) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 2-13 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.8.4.3-1: Common Exception messages for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.8.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.2.8.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.2.8.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.2.8.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.2.8.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.2.8.4.3-7: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.8.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.2.8.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.2.8.4.3-10: *MeasResultListEUTRA*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.2.8.4.3-11: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.2.8.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step7)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	IdReportConfig-P		
}			
measGapConfig	Not present		
}			

Table 8.2.8.4.3-13: *MeasResults*: Additional E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step10)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.2.8.5 Test requirement

Tables 8.2.8.4.1-1, 8.2.8.5-1, 8.2.8.5-2 and 8.2.8.5-3 define the primary level settings including test tolerances for Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX.

Table 8.2.8.5.1-1: Cell specific test parameters for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x1			2x1		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	-3			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB	0			0		
PHICH_RA	dB	-3			-3		
PHICH_RB	dB						
PDCCH_RA	dB	0			0		
PDCCH_RB	dB						
PDSCH_RA	dB	-3			-3		
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36+	2.36
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition		AWGN					
Timing offset to Cell 1	μs	-			3		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 8.2.8.5.1-2: DRX configuration for E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.2.8.5.1-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Intra frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	2	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI\_LC\text{-}UE,\ intra}$ + reporting delay

= 15 + 190 + 2ms from the start of T3

= 207 ms, allow 210 ms.

The rate of correct events observed during repeated tests shall be at least 90%.

8.3 E-UTRAN FDD-FDD Inter-frequency Measurements

8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.3.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

8.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.3.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.1.3-1.

Table 8.3.1.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.1.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.1.

8.3.1.4 Test description

8.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.1.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.1.4.1-1: General test parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.3.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.1.5 Test requirement

Tables 8.3.1.4.1-1 and 8.3.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.3.1.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.3.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.3.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ as shown in table 8.3.2.3-1:

Table 8.3.2.3-1: Requirement to identify a newly detectable FDD inter-frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.256	5.12*N_{freq} (20*N_{freq})	7.68*N_{freq} (30*N_{freq})
0.32	6.4*N_{freq} (20*N_{freq})	7.68*N_{freq} (24*N_{freq})
0.32 < DRX-cycle ≤ 2.56	Note (20*N_{freq})	Note (20*N_{freq})
Note: Time depends upon the DRX cycle in use		

The non DRX requirements in TS 36.133 [4] clause 8.1.2.3.1.1 states that when measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\ Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.2.3-2.

Table 8.3.2.3-2: Requirement to measure FDD inter-frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.08 < DRX-cycle ≤ 2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in TS 36.133 [4] clause 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.2.

8.3.2.4 Test description

8.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.2.4.3.

5. There are two E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
E-UTRA RF Channel Number		1, 2		Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.3.2.5-2
Time offset between cells		3 ms		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	5	30	

8.3.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.2.4.1-1 as appropriate.

8.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.3.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.2.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.3.2.5 Test requirement

Tables 8.3.2.4.1-1, 8.3.2.5-1, 8.3.2.5-2 and 8.3.2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.3.2.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.3.2.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.3.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty+ DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delays measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.3.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delays measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

8.3.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.3.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD inter frequency cell within $T_{identify\ inter}$ as defined in table 8.1.2.3.1.2-1 of TS 36.133 [4] clause 8.1.2.3.1.2.

A cell shall be considered detectable when

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,

- other RSRP related side condition given in TS 36.133 [4] clauses 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.3.3.3-1.

Table 8.3.3.3-1: Requirement to measure FDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.1.1 in 3GPP TS 36.133 [4] are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.3.

8.3.3.4 Test description

8.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 8.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.3.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	dB	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.3.3.5-2
Time offset between cells		3 ms	Asynchronous cells
T1	s	30	
T2	s	9	

8.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. During T1 the SS continuously checks the absence of an A3 triggered measurement report from the neighbour cell. If the UE does not send this during T1, then count neither success nor fail. If the UE sends such a report, then count a fail. Upon a fail in step 5, neither success nor fail are counted in step 7.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.3.5-1 and 8.3.3.5-2.

7. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of “successes” is increased by one, otherwise count a fail.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

10. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

12. Repeat step 1-11 for each sub-test in Table 8.3.3.4.1-1 as appropriate.

8.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.3.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30..30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.3.4.3-5: *MeaResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.3.4.3-7: *FilterCoefficient*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

Table 8.3.3.4.3-8: *MeasObjectEUTRA-GENERIC(Freq)*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighCellConfig	'10'B (The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cells)		
offsetFreq	-14 (dB-14)	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

8.3.3.5 Test requirement

Tables 8.3.3.4.1-1, 8.3.3.5-1, 8.3.3.5-2 and 8.3.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.3.3.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4.00	0.00	4.00	24.00
N_{oc} Note 2	dBm/15 KHz	-95.50	-95.50	-98.00	-98.00
$\hat{E}_s/N_{oc}$	dB	4.00	0.00	4.00	24.00
RSRP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
SCH_RP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.3.3.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.3.3.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.3.3.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.3.4.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.3.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of inter-frequency SI acquisition for HO.

8.3.4.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI, inter}} = T_{\text{basic\_identify\_CGI, inter}} \quad ms$$

Where

$T_{basic\_identify\_CGI,\ inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than 60 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.5 and A.8.3.4.

8.3.4.4 Test description

8.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 8.3.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.3.4.4.3.
5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.4.4.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.3.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions shall be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.4.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.3.4.4.3-6.

8. The UE shall transmit RRCConnectionReconfigurationComplete message.

9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

11. The UE shall transmit RRCConnectionReconfigurationComplete message

12. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays

measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.4.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.3.4.4.3-3: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.4.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.3.4.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.3.4.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.3.4.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.3.4.4.3-9: *SystemInformationBlockType2*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.3.4.4.3-10: *SystemInformationBlockType3*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.3.4.4.3-11: *SystemInformationBlockType5*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig[*n*]	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.3.4.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.3.4.4.3-13: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.3.4.4.3-14: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.4.4.3-15: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

8.3.4.5 Test requirement

Tables 8.3.4.4.1-1 and 8.3.4.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.3.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, inter} = T_{basic\_identify\_CGI, inter} \quad ms$$

$T_{basic\_identify\_CGI, inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133 [4] Section 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.3.5.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in DRX.

8.3.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of inter-frequency SI acquisition for HO. Applicability requires support for FGI bit 5.

8.3.5.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,inter} = T_{basic\_identify\_CGI,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI, inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI, inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.5 and A.8.3.5.

8.3.5.4 Test description

8.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 8.3.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.5.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.5.4.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.3.5.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.3.5.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.5.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.3.5.4.3-10.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.
11. The UE shall transmit RRCConnectionReconfigurationComplete message.
12. UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement then the number of failure tests is increased by one.
13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.5.4.3-1: Common Exception messages for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9

Table 8.3.5.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.5.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.3.5.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.3.5.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.5.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12(-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.3.5.4.3-7: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.5.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.5.4.3-9: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.3.5.4.3-10: MeasGapConfig-Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.3.5.4.3-11: *MeasResultListEUTRA*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.3.5.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.3.5.4.3-13: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.3.5.4.3-14: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.3.5.4.3-15: *MeasResults*: Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.3.5.5 Test requirement

Tables 8.3.5.4.1-1, 8.3.5.5-2 and 8.3.5.5-3 define the primary level settings including test tolerances for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps when DRX is used test.

Table 8.3.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

Table 8.3.5.5-2: DRX configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.3.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8]

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, inter} = T_{basic\_identify\_CGI, inter} \quad ms$$

$T_{basic\_identify\_CGI, inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delay measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells

8.3.6.1 Test purpose

To verify theUE's ability to make a correct reporting of an event without measurement gaps within the E-UTRA FDD inter-frequency cell search requirements.

8.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward with support of Measurement without gaps. Applicability requires support for FGI bits 25.

8.3.6.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex B.2.3 for a corresponding Band
- other RSRP related side conditions given in Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.6.3-1.

Table 8.3.6.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.6.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [2], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.
The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3 and A.8.3.6.

8.3.6.4 Test description

8.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 8.3.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.6.4.3.

5. There are two E-UTRA FDD carriers and two cells on different carrier frequencies and no gaps are configured in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.6.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting without measurement gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active PCell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.3.6.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. PDCCH on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.3.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.6.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms and at least 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator until the measurement report is received during T2 the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.6.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.3.6.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.6.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.6.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.3.6.4.3-5: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.3.6.4.3-6: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		
}			

Table 8.3.6.4.3-7: *SystemInformationBlockType2*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.3.6.4.3-8: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

Table 8.3.6.4.3-9: *SystemInformationBlockType5*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig[*n*]	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2
}			

8.3.6.5 Test requirement

Tables 8.3.6.4.1-1 and 8.3.6.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells test.

Table 8.3.6.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting without measurement gaps

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send continuous ACK/NACK throughout the test, and from the start of T2 until Event A3 is reported, at least 85% ACK/NACK shall be detected.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.3.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test tolerances and Test system uncertainties applicable to this test are undefined.
- Annex E of Cell Configuration table is undefined.
- Antenna diagram is FFS
- Message content is not completed
- Measurement bandwidth n_{PRB} is not signalled
- Test case is missing from TS36.521-2

8.3.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

8.3.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that supports increased number of carrier monitoring.

8.3.7.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

$N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.3.7.3-1.

Table 8.3.7.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\ \_Inter\_FDD}$ [ms] (normal performance)	Physical Layer Measurement period: $T_{Measurement\_Period\ \_Inter\_FDD}$ [ms] (reduced performance)	Measurement bandwidth [RB]
0	480 x K_n x $N_{freq,n}$	480 x K_r x $N_{freq,r}$	6
1 (Note)	240 x K_n x $N_{freq,n}$	240 x K_r x $N_{freq,r}$	50
Note: This configuration is optional			

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies or 8 FDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.3.7.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS36.133 clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS36.133 clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS36.133 clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.7.

8.3.7.4 Test description

8.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] FFS.

2. The general test parameter settings are set up according to Table 8.3.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.7.4.3.

5. There are nine E-UTRA FDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.7.4.1-1: General test parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight FDD carrier frequencies are used in the UE neighbour cell list.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2, Cell 3, Cell 4	Cells 2, 3, 4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
Reduced Performance Group Scaling factor	-	8	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
T1	s	5	
T2	s	40	

8.3.7.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.3.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.3.7.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 30.73s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   and
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the eight FDD carrier frequencies, according to table 8.3.7.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.7.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.3.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.7.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

FFS

8.3.7.5 Test requirement

Tables 8.3.7.4.1-1, 8.3.7.5-1 and 8.3.7.5-2 defines the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.3.7.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions (Cell 1 and Cell 2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4,5,6,7,8 such that cell 2 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.1.		5MHz: R.5 FDD 10MHz: R.0 FDD		-	
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1.		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD	
OCNG Patterns defined in D.1.		5MHz: OP.15 FDD 10MHz: OP.1 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity+TT	7+TT
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT	-Infinity+TT	7+TT
RSRP Note 4	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
SCH_RP Note 4	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
Io Note 4	dBm/ $BW_{channel}$	-64.76+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.7.5-2: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions (Cell 3 and Cell 4)

Parameter	Unit	Cell 3		Cell 4	
		T1	T2	T1	T2
E-UTRA RF Channel Number		Randomly selected from 2,3,4,5,6,7,8 such that cell 3 is in the normal performance group		Randomly selected from 2,3,4,5,6,7,8 such that cell 4 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.1.		-		-	
PDSCH allocation	n_{PRB}	-		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1.		5MHz: R.11 FDD 10MHz: R.6 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD	
OCNG Patterns defined in D.1.		5MHz: OP.16 FDD 10MHz: OP.2 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD	
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0		0	
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
$\hat{E}_s/N_{oc}$	dB	-Infinity	7+TT	-Infinity	7+TT
$\hat{E}_s/I_{ot}$	dB	-Infinity	7+TT	-Infinity	7+TT
RSRP Note 4	dBm/15 kHz	-Infinity	-91+TT	-Infinity	-91+TT
SCH_RP Note 4	dBm/15 kHz	-Infinity	-91+TT	-Infinity	-91+TT
Io Note 4	dBm/ $BW_{channel}$	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	3		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 30.72 s from the beginning of time period T2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4 E-UTRAN TDD-TDD inter frequency measurements

8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.4.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.4.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.4.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	

0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.1.

8.4.1.4 Test description

8.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.4.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.1.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.1.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.4.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.1.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.4.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.4.1.5 Test requirement

Tables 8.4.1.4.1-1 and 8.4.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.1.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.30
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

1) NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells

8.4.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements.

8.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.4.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.2.3-1.

Table 8.4.2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms

≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.2.3-2.

Table 8.4.2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.84	Non DRX Requirements in section 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.2 and A.8.4.2.

8.4.2.4 Test description

8.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.2.4.3.

5. There are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in TS 36.133 [4] Table 8.1.2.1-1 is provided. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		

PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
E-UTRA RF Channel Number		1, 2		Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.4.2.4.1-2
Time offset between cells	μs	3		Synchronous cells 3μs or 92*Ts
T1	s	5		
T2	s	5	30	

8.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.4.2.4.1-1 as appropriate.

8.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.2.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.4.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated- HO		
}			
}			
}			
}			

Table 8.4.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.2.4.3-5: *MeasResults:* Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.4.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.4.2.5 Test requirement

Tables 8.4.2.5-1, 8.4.2.5-2 and 8.4.2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.4.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.4.2.5-2: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.4.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213 [8].

In Test1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.TTI insertion uncertainty = 2 ms

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{\text{Identify\_Inter}} = T_{\text{Basic\_Identify\_Inter}} \cdot \frac{480}{T_{\text{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.4.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used

8.4.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.4.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 5, and 25.

8.4.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.3.3-1

Table 8.4.3.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.3.3-2.

Table 8.4.3.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.08 <DRX-cycle ≤ 2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

Reported RSRP and RSRQ measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ in TS 36.133 [4] section 8.1.2.3.2.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ in TS 36.133 [4] section 8.1.2.3.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.2 and A.8.4.3.

8.4.3.4 Test description

8.4.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 8.4.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.3.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.3.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Time offset between cells	μs	3	synchronous cells
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Uplink-downlink configuration of cells		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cells		6	As specified in table 4.2.1 in TS 36.211
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.4.3.5-2
T1	s	30	
T2	s	9	

8.4.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.4.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. During T1 the SS continuously checks the absence of an A3 triggered measurement report from the neighbour cell. If the UE does not send this during T1, then count neither success nor fail. If the UE sends such a report, then count a fail. Upon a fail in step 5, neither success nor fail are counted in step 7.
6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.3.5-1 and 8.4.3.5-2.
7. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of “successes” is increased by one. Otherwise count a fail.
8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

10. After the RRC connection release, the SS:

- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or

- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

11. Repeat step 2-10 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.3.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.4.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.4.3.4.3-3: *MeasObjectEUTRA-GENERIC(f2)*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for frequency f2 defined in 36.508		
allowedmeasBandwidth	The number of the resource blocks for frequency f2		
presenceAntennaPort1	FALSE		
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
offsetFreq	dB-14	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

Table 8.4.3.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30..30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.3.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.3.4.3-6: *MeaResults*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.3.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.3.4.3-8: *FilterCoefficient*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

8.4.3.5 Test requirement

Tables 8.4.3.4.1-1, 8.4.3.5-1, 8.4.3.5-2 and 8.4.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.4.3.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4.00	0.00	4.00	24.00
N_{oc} Note 2	dBm/15 KHz	-95.50	-95.50	-98.00	-98.00
$\hat{E}_s/N_{oc}$	dB	4.00	0.00	4.00	24.00
RSRP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
SCH_RP Note 3	dBm/15 KHz	-91.50	-95.50	-94.00	-74.00
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.4.3.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.4.3.5-3: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.4.3.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.4 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.4.4.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.4.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of inter-frequency SI acquisition for HO.

8.4.4.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify\_CGI, inter}} = T_{\text{basic\_identify\_CGI, inter}} \quad ms$$

Where

$T_{\text{basic\_identify\_CGI, inter}}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP $\geq$ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 48 and SCH Ês/Iot $\geq$ - 4 dB.
- SCH_RP $\geq$ -124 dBm for Band 41 and SCH Ês/Iot $\geq$ - 4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{\text{basic\_identify\_CGI,inter}}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, no measurement gaps are configured, and TDD configuration as in TS 36.133 [4] Table 8.1.2.3.2.1-1 is used, the UE shall have more than 30 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.7 and A.8.4.4.

8.4.4.4 Test description

8.4.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 8.4.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.4.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.4.4.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.4.4.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.4.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.4.4.4.3-6.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

11. The UE shall transmit RRCConnectionReconfigurationComplete message.

12. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.4.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.4.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.4.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.4.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.4.4.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.4.4.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.4.4.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.4.4.4.3-9: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.4.4.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.4.4.4.3-11: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.4.4.5 Test requirement

Tables 8.4.4.4.1-1 and 8.4.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.4.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, inter} = T_{basic\_identify\_CGI, inter} \quad ms$$

$T_{basic\_identify\_CGI, inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 42 ACK/NACK number is caused by two parts. Firstly, at least 30 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Section TS 36.133 [4] 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.4.5 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

8.4.5.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps with DRX.

8.4.5.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of inter-frequency SI acquisition for HO. Applicability requires support for FGI bit 5.

8.4.5.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of ‘reportCGI’. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of ‘reportCGI’, regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$\mathrm{T}_{\mathrm{identify\_CGI,inter}} = \mathrm{T}_{\mathrm{basic\_identify\_CGI,inter}} \quad ms$$

Where

$T_{basic\_identify\_CGI,\ inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP $\geq$ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 48 and SCH Ês/Iot $\geq$ - 4 dB.
- SCH_RP $\geq$ -124 dBm for Band 41 and SCH Ês/Iot $\geq$ - 4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.7 and A.8.4.5.

8.4.5.4 Test description

8.4.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 8.4.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.5.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.5.4.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.4.5.5-2
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331 [5].
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
T2	s	≤30	UE shall report cell within 25.6s (20 DRX cycles)
T3	s	5	

8.4.5.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.5.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.4.5.4.3-10.

8. The UE shall transmit RRCConnectionReconfigurationComplete message.

9. SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to UE.

11. The UE shall transmit RRCConnectionReconfigurationComplete message.

12. UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. If the overall delays measured from the beginning of time period T3 is less than 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, then the number of failure tests is increased by one.

13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.5.4.3-1: Common Exception messages for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9

Table 8.4.5.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.4.5.4.3-3: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for real-time services.	
sf1280	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	Infinity		
}			

Table 8.4.5.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 8.4.5.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.4.5.4.3-6: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12(-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.4.5.4.3-7: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.5.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.4.5.4.3-9 *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.4.5.4.3-10: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.4.5.4.3-11: *MeasResultListEUTRA*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.4.5.4.3-12: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellForWhichToReportCGI	Physical Cell ID of Cell 2		Cell 1
}			

Table 8.4.5.4.3-13: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.4.5.4.3-14: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.4.5.4.3-15: *MeasResults*: Additional E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.4.5.5 Test requirement

Tables 8.4.5.4.1-1 ,8.4.5.5-1, 8.4.5.5-2 and 8.4.5.5-3 define the primary level settings including test tolerances for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX test.

Table 8.4.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.5.5-2: DRX configuration for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.4.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	Infinity	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	2	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section10.1 in 3GPP TS 36.213 [8].

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI, inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI, inter} = T_{basic\_identify\_CGI, inter} \quad ms$$

$T_{basic\_identify\_CGI, inter}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4.6

8.4.7 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Increased Carrier Monitoring without Reduced Performance Group

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test tolerances and Test system uncertainties applicable to this test are undefined.
- Annex E of Cell Configuration table is undefined.
- Antenna diagram is FFS
- Message content is not completed
- Measurement bandwidth n_{PRB} is not signalled
- Test case is missing from TS36.521-2

8.4.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward that supports increased number of carrier monitoring.

8.4.7.3 Minimum conformance requirements

When measurement gaps are scheduled, or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms \text{ (normal performance) and}$$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,r} \cdot K_r \quad ms \text{ (reduced performance)}$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

$N_{freq,n}$ $N_{freq,r}$ K_n and K_r are defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS 36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] Sections 9.1.17.3.1 and 9.1.17.3.2 are fulfilled for a corresponding Band,
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.4.7.3-1.

Table 8.4.7.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\ \_Inter\_TDD}$ [ms] (normal performance)	Physical Layer Measurement period: $T_{Measurement\_Period\ \_Inter\_TDD}$ [ms] (reduced performance)	Measurement bandwidth [RB]
0	480 x K_n x $N_{freq,n}$	480 x K_r x $N_{freq,r}$	6
1 (Note)	240 x K_n x $N_{freq,n}$	240 x K_r x $N_{freq,r}$	50
Note: This configuration is optional			

The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies or 8 TDD interfrequencies if the UE supports Increased UE carrier monitoring E-UTRA and the UE physical layer shall be capable of reporting RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period defined in Table 8.4.7.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\text{-}inter}$ defined in TS36.133 clause 8.1.2.3.1.1. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS36.133 clause 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_TDD}$ defined in TS36.133 clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.4.7.

8.4.7.4 Test description

8.4.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] FFS.
2. The general test parameter settings are set up according to Table 8.4.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.4.7.4.3.
5. There are nine E-UTRA TDD frequencies defined and four cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.7.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
UE configured E-UTRA RF Channel Number		1, 2,3,4,5,6,7,8,9	Serving cell and eight TDD carrier frequencies are used in the UE neighbour cell list.
Test equipment configuration		Cell 1 uses UTRA RF channel number 1 Cells 2,3,4 are randomly selected to use different frequencies selected from frequencies 2,3,4,5,6,7,8,9	
Gap Pattern Id		1	As specified in TS 36.133 clause 8.1.2.1.
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	80	

8.4.7.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.4.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables and 8.4.7.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3 for cells 2, 3 and 4. If the measurement reporting delay from the beginning of time period T2 is less than 30.73s the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set physical cell identity = ((current physical cell identity + 1) mod 14 + 2) for Cells 2, 3 and 4 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
   and
   - randomly re-assign the frequencies for cells 2, 3 and 4 among the eight TDD carrier frequencies, according to table 8.4.7.4.1-1.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.7.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.4.7.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.7.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.7.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

FFS

8.4.7.5 Test requirement

Tables 8.4.7.4.1-1, 8.4.7.5-1 and 8.4.7.5-2 defines the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.7.5-1: Cell specific test requirement parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions (Cell 1 and Cell 2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		Randomly selected from 2,3,4,5,6,7,8 such that cell 2 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.2.		5MHz: R.5 TDD 10MHz: R.0 TDD		-	
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2.		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD	
OCNG Patterns defined in D.2.		5MHz: OP.15 TDD 10MHz: OP.1 TDD		5MHz: OP.16 TDD 10MHz: OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98+TT		-98	
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity+TT	7+TT
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT	-Infinity+TT	7+TT
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91
Io Note 4	dBm/ $BW_{channel}$	-64.76+10log($N_{RB,c}$/50)	-64.76+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.4.7.5-2: Cell specific test requirement parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions (Cell 3 and Cell 4)

Parameter	Unit	Cell 3		Cell 4	
		T1	T2	T1	T2
E-UTRA RF Channel Number		Randomly selected from 2,3,4,5,6,7,8 such that cell 3 is in the normal performance group		Randomly selected from 2,3,4,5,6,7,8 such that cell 4 is in the normal performance group	
$BW_{channel}$	MHz	5MHz: N_{RB} = 25 10MHz: N_{RB} = 50		5MHz: $N_{RB,}$= 25 10MHz: $N_{RB,}$= 50	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27		5MHz: 10-15 10MHz: 22-27	
PDSCH Reference measurement channel defined in A.1.2.		-		-	
PDSCH allocation	n_{PRB}	-		-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2.		5MHz: R.11 TDD 10MHz: R.6 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD	
OCNG Patterns defined in D.2.		5MHz: OP.16 TDD 10MHz: OP.2 TDD		5MHz: OP.16 TDD 10MHz: OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98+TT		-98+TT	
$\hat{E}_s/N_{oc}$	dB	-Infinity	7+TT	-Infinity	7+TT
$\hat{E}_s/I_{ot}$	dB	-Infinity	7+TT	-Infinity	7+TT
RSRP Note 4	dBm/15 kHz	-Infinity	-91	-Infinity	-91
SCH_RP Note 4	dBm/15 kHz	-infinity	-91	-infinity	-91
Io Note 4	dBm/ $BW_{channel}$	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)	-70.22+10log($N_{RB,c}$/50)	-62.43+10log($N_{RB,c}$/50)
Propagation Condition		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to cell 1	ms	3		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send Event A3 triggered measurement reports for cells 2, 3 and 4, with a measurement reporting delay less than 61.44 s from the beginning of time period T2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.5 E-UTRAN FDD - UTRAN measurements

8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

8.5.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 15 and 22.

8.5.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify, UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{basic\ measurement\ UTRA\_FDD}$ = 6 (cells)

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurement\ UTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.5.1.

8.5.1.4 Test description

8.5.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.

2. The general test parameter settings are set up according to Table 8.5.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.1.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.1.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to Cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.5.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.5.1.5-1 and 8.5.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.1.5-1 and 8.5.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.5.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.5.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.5.1.5 Test requirement

Tables 8.5.1.4.1-1, 8.5.1.5-1 and 8.5.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.5.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (Cell 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.5.1.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions

8.5.2.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN FDD - UTRAN FDD cell search requirements for identification of a new UTRA FDD cell for SON given in TS 36.133 [4] section 8.1.2.4.7.1.1.

8.5.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 5, 19 and 22.

8.5.2.3 Minimum conformance requirements

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{\text{Tinter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify,\ UTRA\_FDD}$ ms, the UE may stop searching UTRA cells for SON.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.7 and A.8.5.2.

8.5.2.4 Test description

8.5.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 8.5.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.2.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.2.4.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	>5	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	s	6	

8.5.2.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.5.2.5-1 and 8.5.2.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

4. SS shall transmit an RRCConnectionReconfiguration message.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.5.2.5-1 and 8.5.2.5-2.

7. The UE shall transmit a MeasurementReport message containing the primary scrambling code of cell 2. If the overall delays measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.2.4.3-1: Common Exception messages for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.5.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod	2 entry		
MeasObjectToAddMod ::= SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod ::= SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF ReportConfigToAddMod	1 entry		
ReportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT-SON-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of MeasIdToAddMod	1 entry		
MeasIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.5.2.4.3-3: *ReportConfigInterRAT-SON-UTRA*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-SON-UTRA::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose ENUMERATED {	reportStrongestCellsForSON		
}			
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	1		
}			

Table 8.5.2.4.3-4: *MeasResults*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.2.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA			
MeasResultUTRA ::= SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	The primary scrambling code, as defined in TS 25.331	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			
}			
}			

8.5.2.5 Test requirement

Tables 8.5.2.4.1-1, 8.5.2.5-1 and 8.5.2.5-2 define the primary level settings including test tolerances for UTRAN FDD cell search for SON ANR under AWGN propagation conditions test.

Table 8.5.2.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.5.2.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-2.95
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14.73
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 4802 ms from the beginning of time period T2.

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{\text{identify, UTRA\_FDD}} = T_{\text{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{\text{Tinter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{\text{basic\_identify\_UTRA\_FDD}}$ = 300 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90% with a confidence level of 95%.

8.5.3 E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

8.5.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 5, 15 and 22.

8.5.3.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{\text{identify, UTRA\_FDD}}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within Tidentify, UTRA_FDD as in table 8.5.3.3-1.

Table 8.5.3.3-1: Requirements to identify a newly detectable UTRA FDD cell

DRX cycle length (s)	$T_{identify\_UTRA\_FDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable
0.064	2.56* Nfreq (40* Nfreq)	4.8* Nfreq (75* Nfreq)
0.08	3.2* Nfreq (40* Nfreq)	4.8* Nfreq (60* Nfreq)
0.128	3.2* Nfreq (25* Nfreq)	4.8* Nfreq (37.5* Nfreq)
0.16	3.2* Nfreq (20* Nfreq)	4.8* Nfreq (30* Nfreq)
0.16<DRX-cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The UE shall be capable of performing RSCP and Ec/Io measurements of at least 6 UTRA cells per UTRA FDD carrier and the UE physical layer shall be capable of reporting RSCP and Ec/Io measurements to higher layers with the measurement period defined in table 8.5.3.3-2.

Table 8.5.3.3-2: Requirements to measure UTRA FDD cells

DRX cycle length (s)	$T_{measure\_UTRA\_FDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	**Gap period = 80 ms**
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable
0.064	0.48* N_{freq} (7.5* N_{freq})	0.8* N_{freq} (12.5* N_{freq})
0.08	0.48* N_{freq} (6* N_{freq})	0.8* N_{freq} (10* N_{freq})
0.128	0.64* N_{freq} (5* N_{freq})	0.8* N_{freq} (6.25* N_{freq})
0.128<DRX-cycle≤2.56	Note (5* N_{freq})	Note (5* N_{freq})
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1.2 and A.8.5.3.

8.5.3.4 Test description

8.5.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.

2. The general test parameter settings are set up according to Table 8.5.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.3.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.3.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on UTRA RF channel number 1.
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
UTRA RF Channel Number		1		One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io		
b1-Threshold-UTRA	dB	-18		CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.5.3.5-2
Monitored UTRA FDD cell list size		12		UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5		
T2	s	6	30	

8.5.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.5.3.5-1, 8.5.3.5-2, 8.5.3.5-3 and 8.5.3.5-5. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.3.5-1 and 8.5.3.5-4. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 2442 ms for Test 1 or less than 26882 ms for Test 2 then the number of

successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.2.4.1-1 as appropriate.

8.5.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.3.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-4 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.5.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.5.3.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0(0 dB)		
}			
}			
}			

Table 8.5.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.5.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.3.4.3-6: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 8.5.3.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.5.3.5 Test requirement

Tables 8.5.3.4.1-1, 8.5.3.5-1 and 8.5.3.5-4 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.5.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.5.3.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.5.3.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

Table 8.5.3.5-4: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delays measured when DRX cycle length is 40 ms in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$=

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 60 ms.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 2442 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_UTRA\_FDD}$

$T_{identify\_UTRA\_FDD}$ = 25600 ms. When DRX cycle length is 1280 ms the $T_{identify\_UTRA\_FDD}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

8.5.4.1 Test purpose

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN cells. This test will partly verify the Enhanced UTRA FDD cell identification requirements in section 8.1.2.4.1.1.1a.

8.5.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD. Applicability requires support for FGI bit 15.

8.5.4.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length ≤ 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\ enhanced\_UTRA\_FDD}$:

$$T_{identify,\ enhanced\_UTRA\_FDD} = (T_{basic\_identify\_enhanced\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} + 480)\ N_{Freq} \quad ms$$

A cell shall be considered detectable when:

- CPICH Ec/Io ≥ -15 dB,
- SCH_Ec/Io ≥ -15 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1.1.1a and A.8.5.4.

8.5.4.4 Test description

8.5.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 8.5.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.4.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN FDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.5.4.4.1-1: General test parameters for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
T1	s	5	
T2	s	2	

8.5.4.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.5.4.5-1 and 8.5.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionReconfiguration* with Event B1 configured message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.5.4.5-1 and 8.5.4.5-2. T2 starts.

6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 962 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.4.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.5.4.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	UTRA-Thres is actual Ec/No value in dB (UTRA-Thres * 2 + 49)	UTRA-FDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.5.4.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.4.4.3-4: *MeasResultListUTRA*: E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test INTEGER (0..49)	
}			
}			

8.5.4.5 Test requirement

Tables 8.5.4.4.1-1, 8.5.4.5-1 and 8.5.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions test.

Table 8.5.4.5-1: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.5.4.5-2: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	- infinity	0.02
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io Note 3	dB	- infinity	-13
Propagation Condition		AWGN	

Note 1: The DPCH level is controlled by the power control loop.
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.
Note 3: This gives an SCH Ec/Io of -15dB

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send the first measurement report containing the primary scrambling code of cell 2.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, enhanced\_UTRA\_FDD}$

$$T_{identify,\ enhanced\_UTRA\_FDD} = (T_{basic\_identify\_enhanced\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} + 480)\ N_{Freq} \quad ms$$

$T_{basic\_identify\_enhanced\_UTRA\_FDD}$ = 60 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] section 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 60 ms. It is defined in TS 36.133 [4] section 8.1.2.1.

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 962 ms in this test case (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.5

FFS

8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

8.5.6.1 Test purpose

To verify the UE's ability to make a correct reporting of an event without measurement gaps within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that support UTRA FDD with support of Measurement without gaps. Applicability requires support for FGI bits 15 and 22.

8.5.6.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,

- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 with measurement period given by

$$T_{\text{measurement\_UTRA\_FDD}} = Max\left\{T_{\text{Measurement\_Period UTRA\_FDD}}, T_{\text{basic\_measurement\_UTRA\_FDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{\text{basic measurementUTRA\_FDD}}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_FDD}}$.

$X_{\text{basic measurement UTRA\_FDD}} = 6$

$T_{\text{Measurement\_Period UTRA\_FDD}}$ = 480 ms. The period used for calculating the measurement period $T_{\text{measurement\_UTRA\_FDD}}$ for UTRA FDD CPICH measurements.

$T_{\text{basic\_identify\_UTRA\_FDD}}$ = 300 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] clause 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{\text{basic\_identify\_enhanced\_UTRA\_FDD}}$ = 60 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] clause 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{\text{basic\_measurement\_UTRA\_FDD}}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

N_{freq} is defined in clause 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] clause 8.1.2.1

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify, UTRA\_FDD}}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1 for the minimum requirements or $T_{\text{identify, enhanced\_UTRA\_FDD}}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.5.6.

8.5.6.4 Test description

8.5.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 8.5.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.6.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.6.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.3 FDD	As specified in clause A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.5.6.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. PDCCH on the PCell shall be sent continuously to ensure that the UE sends ACK/NACKs throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.5.6.5-1 and 8.5.6.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.6.5-1 and 8.5.6.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms and at least 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator until the measurement report is received during T2 the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 85% of all ACK/NACKS transmitted by the UE are detected by the system simulator then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.6.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.5.6.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.5.6.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.6.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 8.5.6.4.3-5: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.5.6.4.3-6: *SystemInformationBlockType2*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

8.5.6.5 Test requirement

Tables 8.5.6.4.1-1, 8.5.6.5-1 and 8.5.6.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions test.

Table 8.5.6.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of UTRAN FDD cell without measurement gaps under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.10 (OP.10 FDD)		OP.10 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.5.6.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell without measurement gaps under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send continuous ACK/NACK throughout the test, and from the start of T2 until Event A3 is reported, at least 85% ACK/NACK shall be detected.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth

8.5.7.1 Test purpose

Same test purpose as defined in clause 8.5.1.1.

8.5.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD and only support E-UTRA Band 31. Applicability requires support for FGI bits 15 and 22.

8.5.7.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.5.1.3 with the following exceptions:

- Instead of A.8.5.1 → use A.8.5.7.

8.5.7.4 Test description

8.5.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 8.5.7.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.5.7.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.7.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1.
E-UTRA Channel Bandwidth (BWchannel)	MHz	5	
NOTE 1: See Table 8.5.1.4.1-1 for the other parameters. NOTE 2: This test is according to the principle defined in TS 36.133 [4] section A.3.7.2.			

8.5.7.4.2 Test procedure

Same test procedure as defined in clause 8.5.1.4.2 with the following exceptions:

- Instead of Table 8.5.1.5-1 → use Table 8.5.7.5-1.

8.5.7.4.3 Message contents

Same message contents as defined in clause 8.5.1.4.3.

8.5.7.5 Test requirement

Same test requirement as defined in clause 8.5.1.5 with the following exceptions:

Tables 8.5.7.4.1-1, 8.5.7.5-1 and 8.5.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells for 5MHz bandwidth test.

Table 8.5.7.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (Cell 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions for 5MHz bandwidth

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	5	
OCNG Pattern defined in D.1.15		OP.15 FDD	
NOTE: See Table 8.5.1.5-1 for the other parameters.			

8.6 E-UTRAN TDD - UTRAN FDD measurements

8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

8.6.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA FDD cell search requirements.

8.6.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD. Applicability requires support for FGI bits 15 and 22.

8.6.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{\text{identify, UTRA\_FDD}}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, UTRA\_FDD}} = T_{\text{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq} \quad ms$$

Where:

$T_{\text{basic\_identify\_UTRA\_FDD}}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$T_{\text{measurement\_UTRA\_FDD}} = Max\left\{T_{\text{Measurement\_Period UTRA\_FDD}}, T_{\text{basic\_measurement\_UTRA\_FDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{\text{basic measurement UTRA\_FDD}}$ = 6 (cells)

$T_{\text{Measurement\_Period UTRA\_FDD}}$ = 480 ms. The period used for calculating the measurement period.

$T_{\text{basic\_measurement\_UTRA\_FDD}}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{\text{basic measurement UTRA\_FDD}}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_FDD}}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify UTRA\_FDD}}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.2 and A.8.6.1.

8.6.1.4 Test description

8.6.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 8.6.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.6.1.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.6.1.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.6.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.6.1.5-1 and 8.6.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2.. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.6.1.5-1 and 8.6.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.6.1.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.6.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0dB)		
}			
}			

Table 8.6.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServiCCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.6.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	UTRA-FDD-CellIdentity		
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.6.1.5 Test requirement

Tables 8.6.1.4.1-1, 8.6.1.5-1 and 8.6.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.6.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		

OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.6.1.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI$_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7 E-UTRAN TDD - UTRAN measurements

8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Editor's note: It only includes 1.28 Mcps TDD option related requirements

8.7.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA TDD cell search requirements.

8.7.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 that support UTRA TDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.7.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD}$.

$X_{basic\ measurementUTRA\_TDD} = 6$

$T_{Measurement\_Period\ UTRA\_TDD} = 480$ ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD} = 800$ ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD} = 50$ ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.7.1.

8.7.1.4 Test description

8.7.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 8.7.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.7.1.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7.1.4.1-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	

8.7.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.7.1.5-1 and 8.7.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7.1.5-1 and 8.7.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6402 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall change to set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.1.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.7.1.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	28	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.7.1.5 Test requirement

Tables 8.7.1.4.1-1, 8.7.1.5-1 and 8.7.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.7.1.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
$\hat{E}_s/I_{ot}$	dB	9	9
$\hat{E}_s/N_{oc}$	dB	9	9
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-89	-89
SCH_RP	dBm/15kHz	-89	-89
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.7.1.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI$_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions

Editor's note: It only includes 1.28 Mcps TDD option related requirements

8.7.2.1 Test purpose

The test cases are to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify E-UTRA TDD to UTRA TDD cell search requirements when DRX is used in TS 36.133 [4] section 8.1.2.4.3.2.

8.7.2.2 Test applicability

This test applies to all types of release 8 E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 5, 15 and 22.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 5, 15 and 22.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 5, 15 and 39.

8.7.2.3 Minimum conformance requirements

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify\_UTRA\_TDD}$ as shown in table 8.7.2.3-1

Table 8.7.2.3-1: Requirement to identify a newly detectable UTRA TDD cell

DRX cycle length (s)	$T_{identify\_UTRA\_TDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.32	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable
0.32<DRX-cycle≤0.512	Note (20* Nfreq)	Note (25* Nfreq)
0.512<DRX-cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

- P-CCPCH Ec/Io ≥ -8 dB,
- DwPCH_Ec/Io ≥ -5 dB.

When L3 filtering is used an additional delay can be expected.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements of at least 6 UTRA cells per UTRA TDD carrier and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period defined in table 8.7.2.3-2.

Table 8.7.2.3-2: Requirement to measure UTRA TDD cells

DRX cycle length (s)	$T_{measure\_UTRA\_TDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.3.1 are applicable
0.064	$0.48*N_{freq}$ ($7.5*N_{freq}$)	$0.8*N_{freq}$ ($12.5*N_{freq}$)
0.08	$0.48*N_{freq}$ ($6*N_{freq}$)	$0.8*N_{freq}$ ($10*N_{freq}$)
0.128	$0.64*N_{freq}$ ($5*N_{freq}$)	$0.8*N_{freq}$ ($6.25*N_{freq}$)
0.128<DRX-cycle≤2.56	Note ($5*N_{freq}$)	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clause 9.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.2 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements TS 36.133 [4] in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.2.2 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.2 and A.8.7.2.

8.7.2.4 Test description

8.7.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 8.7.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.7.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.7.2.4.1-1: General test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Active cell		Cell 1		E-UTRAN TDD cell
Neighbour cell		Cell 2		UTRAN 1.28Mcps TDD cell
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
PRACH configuration		4		As specified in table 5.7.1-3 in 3GPP TS 36.211
CP length of cell 1		Normal		
Ofn	dB	0		
Thresh	dBm	-83		Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.7.2.5-3
Time offset between cells	ms	3		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	8	30	

8.7.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table’s 8.7.2.5-1 and 8.7.2.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table’s 8.7.2.5-1 and 8.7.2.5-2. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6442 ms for Test1 or less than 26882 ms for Test2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.7.2.4.1-1 as appropriate.

8.7.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.2.4.3-1: Common Exception messages for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-4 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.7.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.7.2.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
thresholdUTRA-RSCP	32	UTRA-Thres + 115 UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
hysteresis	0	The actual value is IE value * 0.5 dB INTEGER (0..30)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.7.2.4.3-5: *MeasResults*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.2.4.3-6: *MeasResultListUTRA*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	PhysCellIdUTRA-TDD INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

Table 8.7.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.7.2.5 Test requirement

The common test parameters are given in Tables 8.7.2.4.1-1, 8.7.2.5-1 and 8.7.2.5-2. DRX configuration for Test1 and Test2 are given in Table 8.7.2.5-3 and time alignment timer and scheduling request related parameters in Table 8.7.2.5-4.

Table 8.7.2.5-1: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		

$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc} Note 2	dBm/15kHz	-98	
RSRP Note 3	dBm/15kHz	-94	-94
SCH_RP Note 3	dBm/15kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.7.2.5-2: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	9	-inf	9
I_{oc}	dBm/1.28 MHz	-80.40			
PCCPCH RSCP	dBm	-inf	-74.40	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

Table 8.7.2.5-3: drx-Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.7.2.5-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event B1 triggered the measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$=

$$T_{identify,\ \ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 6442 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_UTRA\_TDD}$

$T_{identify\_UTRA\_TDD}$ = 25600 ms. When DRX cycle length is 1280 ms the $T_{identify\_UTRA\_TDD}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions

8.7.3.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN TDD cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN TDD - UTRAN TDD cell search requirements for identification of a new UTRA TDD cell for SON given in TS 36.133 [4] section 8.1.2.4.13.1.

8.7.3.2 Test applicability

This test applies to all types of release 8 E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 19 and 22.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 22 and 37.

This test applies to all types of release 9 and forward E-UTRA TDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 37 and 39.

8.7.3.3 Minimum conformance requirements

When no DRX is used the UE shall be able to identify a new cell within:

$$\mathrm{T}_{\text{identify, UTRA\_TDD}} = \mathrm{T}_{\text{basic\_identify\_UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} \cdot N_{Freq} \quad ms$$

$\mathrm{T}_{\text{basic\_identify\_UTRA\_TDD}}$ = 800 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA TDD cell for SON within 8*$\mathrm{T}_{\text{identify, UTRA\_TDD}}$ ms, the UE may stop searching UTRA TDD cells for SON.

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $\mathrm{T}_{\text{identify, UTRA\_TDD}}$ defined in section 8.1.2.4.13.1.1 in TS 36.133 [4] and in section 8.1.2.4.13.1.2 in TS 36.133 [4] for non DRX and DRX cases respectively. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.13 and A.8.7.3.

8.7.3.4 Test description

8.7.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.
2. The general test parameter settings are set up according to Table 8.7.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.7.3.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7.3.4.1-1: General test parameters for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	>5	During T1, cell 2 shall be powered off, and during the off time the scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	s	14	

8.7.3.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.7.3.5-1 and 8.7.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.7.3.5-1 and 8.7.3.5-2.

6. The UE shall transmit a MeasurementReport message containing the cell parameter id of cell 2. If the overall delays measured from the beginning of time period T2 is less than 12802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.3.4.3-1: Common Exception messages for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.7.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	f1 is the frequency of the serving cell (E-UTRA Cell)	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f2)	f2 is the frequency of the neighbouring cell (UTRA Cell)	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
ReportConfigToAddMod SEQUENCE {			
reportConfigId	idReportConfig		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT-SON-UTRA		
}			
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.7.3.4.3-3: *ReportConfigInterRAT-SON-UTRA*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-SON-UTRA::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose ENUMERATED {	reportStrongestCellsForSON		
}			
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.7.3.4.3-4: *MeasResults*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.3.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA			
MeasResultUTRA ::= SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	The cell parameter id, as defined in TS 25.331	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

8.7.3.5 Test requirement

Tables 8.7.3.4.1-1, 8.7.3.5-1 and 8.7.3.5-2 define the primary level settings including test tolerances for UTRAN TDD cell search for SON ANR under AWGN propagation conditions test.

Table 8.7.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.7.3.5-2: Cell specific test parameters for UTRAN TDD (cell # 2) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1		T2	
UTRA RF Channel number Note2		Channel 2			
DL timeslot number		0	DwPTS	0	DwPTS
PCCPCH_Ec/Ior	dB	-3		-3	
DwPCH_Ec/Ior	dB		0		0
OCNS_Ec/Ior	dB	-3		-3	
Îor/Ioc	dB	-Infinity		5	
PCCPCH RSCP Note1	dBm	-Infinity	n.a.	-73	n.a.
Io Note1	dBm/1.28MHz	-Infinity		-70.88	
Ioc	dBm/1.28MHz	-75			
Propagation condition		AWGN			

Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

The UE shall send the first measurement report containing the physical cell identity of cell 2, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

When no DRX is used the UE shall be able to identify a new cell within:

$$\mathrm{T}_{\text{identify, UTRA\_TDD}} = \mathrm{T}_{\text{basic\_identify\_UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} \cdot N_{Freq} \quad ms$$

$\mathrm{T}_{\text{basic\_identify\_UTRA\_TDD}}$ = 800 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$\mathrm{T}_{\text{Inter1}}$ = 30 ms. TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90% with a confidence level of 95%.

8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

8.7.4.1 Test purpose

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN TDD cells. This test will partly verify the Enhanced UTRA TDD cell identification requirements in TS 36.133 [4] section 8.1.2.4.3.1.1a under AWGN propagation conditions.

8.7.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.7.4.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length ≤ 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $\mathrm{T}_{\text{identify, enhanced\_UTRA\_TDD}}$:

$$\mathrm{T}_{\text{identify, enhanced\_UTRA\_TDD}} = (\mathrm{T}_{\text{basic\_identify\_enhanced\_UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} + 480) \cdot N_{Freq} \quad ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 500 ms.

A cell shall be considered detectable when:

- P-CCPCH_Ec/Io ≥ -6 dB,
- DwPCH_Ec/Io ≥ -1 dB

When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.1.1a and A.8.7.4.

8.7.4.4 Test description

8.7.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 8.7.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.7.4.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.7.4.4.1-1: General test parameters for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Monitored UTRA TDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
T1	s	5	
T2	s	2	

8.7.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.7.4.5-1 and 8.7.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionReconfiguration* with event B1 configured message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.7.4.5-1 and 8.7.4.5-2. T2 starts.

6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 1122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the *MeasurementReport* message in step 6) or when T2 expires, the SS shall transmit *RRCConnectionRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.4.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.7.4.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	32	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.4.4.3-4: *MeasResultListUTRA*: E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.7.4.5 Test requirement

Tables 8.7.4.4.1-1, 8.7.4.5-1 and 8.7.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions test.

Table 8.7.4.5-1: Cell specific test parameters for cell 1 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.7.4.5-2: Cell specific test parameters for cell 2 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number Note1		1			
P-CCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior Note2	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	- infinity	8	- infinity	8
I_{oc}	dBm/1.28 MHz	-79.4			
P-CCPCH RSCP Note3	dBm	- infinity	-76.17	n.a.	n.a.
P-CCPCH_Ec/Io Note3	dB	- infinity	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	- infinity	-0.64
Propagation Condition		AWGN			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, enhanced\_UTRA\_TDD}$

$$T_{identify,\ enhanced\_UTRA\_TDD} = (T_{basic\_identify\_enhanced\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} + 480) \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_enhanced\_UTRA\_TDD}$ = 80 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1122 ms in this test case (note: this gives a total of 1120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.8 E-UTRAN FDD - GSM measurements

8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN

8.8.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when doing inter-RAT (GSM) measurements under AWGN condition within the E-UTRA FDD - GSM cell search requirements.

8.8.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 15 and 23.

8.8.1.3 Minimum conformance requirements

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as $N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5 and A.8.8.1

8.8.1.4 Test description

8.8.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The general test parameter settings are set up according to Table 8.8.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.8.1.4.3.
5. There is one E-UTRA FDD carrier and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.8.1.4.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	5	

8.8.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.8.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.8.1.5-1 and 8.8.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 3122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.8.1.4.3-1: Common Exception messages for E-UTRAN FDD - GSM Event triggered reporting in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-10

Table 8.8.1.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.8.1.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0 dB)		
}			
}			
}			

Table 8.8.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.6.1.4.3-5: *MeasResultListGERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

8.8.1.5 Test requirement

Tables 8.8.1.4.1-1, 8.8.1.5-1 and 8.8.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-GSM event triggered reporting under AWGN conditions.

Table 8.8.1.5-1: Cell specific test parameters for E-UTRAN FDD (Cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
$\hat{E}_s/N_{oc}$		4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.8.1.5-2: Cell specific test parameters for GSM (Cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE sends one Event B1 triggered measurement report including BSIC of Cell 2.

The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured shall be less than a total of 3122 ms in this test case. (The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay plus the TTI insertion uncertainty of 2ms).

The event triggered measurement reporting delay = 2*$T_{\text{Measurement Period, GSM}}$ = 2* 480 ms = 960 ms.

Initial BSIC identification delay = 2160 ms.

TTI insertion uncertainty = 2 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.8.2 E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN

8.8.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when doing inter-RAT (GSM) measurements under AWGN condition within the E-UTRA FDD - GSM cell search requirements.

8.8.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 5, 15 and 23.

8.8.2.3 Minimum conformance requirements

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4]. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{\text{GSM carrier RSSI}}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{\text{Measurement Period, GSM}}$, for the GSM carrier RSSI measurement is shown in Table 8.1.2.4.5.2.1-1 in TS 36.133 [4]. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as $N_{freq} = N_{\text{freq, E-UTRA}} + N_{\text{freq, UTRA}} + M_{gsm}$

Where:

$N_{\text{freq, E-UTRA}}$ is the number of E-UTRA carriers being monitored

$N_{freq, UTRA}$ is the number of UTRA carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers, GSM}$ /20) where $N_{carriers, GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.2.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in TS 36.331 [5].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.

- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.

- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.

- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re-confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be made on GSM cells that are required with BSIC verified.

For DRX cycle length ≤ 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.1 in TS 36.133 [4] shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every N_{freq}*30s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within N_{freq}*60 s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the

BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in section 8.1.2.1.1 in TS 36.133 [4].

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length ≤ 40 ms, GSM BSIC re-confirmation requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.2 in TS 36.133 [4] shall apply.

For DRX cycle length > 40 ms, at least every N_{freq}*30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell. If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within N_{freq}*60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.4.5.2.2.1 in TS 36.133 [4]. The parameter N_{freq} is defined in section 8.1.2.1.1 in TS 36.133 [4].

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1 of TS 36.133 [4]. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.2 and A.8.8.2.

8.8.2.4 Test description

8.8.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The general test parameter settings are set up according to Table 8.8.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.8.2.4.3.

5. There is one E-UTRA FDD carrier and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.8.2.4.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD		As specified in section A.1.2.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI		
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.8.2.5-2
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1		List of GSM cells provided before T2 starts.
T1	s	5		
T2	s	5	45	

8.8.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.8.2.5-1, 8.8.2.5-2, 8.8.2.5-3 and 8.8.2.5-4. propagation conditions are set according to Annex B clause B.1.1.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.8.2.5-1 and 8.8.1.5-4. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 3162 ms for Test 1 or less than 44082 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.8.2.4.1-1 as appropriate.

8.8.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.8.2.4.3-1: Common Exception messages for E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-10 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.8.2.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.8.2.4.3-3: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.8.2.4.3-4: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0 dB)		
}			
}			
}			

Table 8.8.2.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.8.2.4.3-6: *MeasResults*: Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.8.2.4.3-7: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.8.2.4.3-8: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.8.2.5 Test requirement

Tables 8.8.2.4.1-1, 8.8.2.5-1 and 8.8.2.5-4 define the primary level settings including test tolerances for E-UTRAN FDD-GSM event triggered reporting when DRX is used under AWGN conditions.

Table 8.8.2.5-1: Cell specific test parameters for E-UTRAN FDD (Cell # 1) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.8.2.5-2: DRX-Configuration to be used in E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.8.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-GSM Event triggered reporting when DRX is used in AWGN

Field	Test1 Value	Test2 Value	Comment
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

Table 8.8.2.5-4: Cell specific test parameters for GSM (Cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = 2*$T_{\text{Measurement Period, GSM}}$ + $T_{\text{identify, GSM}}$ + TTI insertion uncertainty + DRX cycle length

$T_{\text{Measurement Period, GSM}}$ = 480 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

$T_{\text{identify, GSM}}$ = 2160 ms (as specified in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.1.2.1)

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3162 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = 2*$T_{\text{Measurement Period, GSM}}$ + N_{freq} * 30s + TTI insertion uncertainty + DRX cycle length

$T_{\text{Measurement Period, GSM}}$ = 6400 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

N_{freq} = 1 (as specified in TS 36.133 clause 8.1.2.1.1)

N_{freq} * 30 s = 30000 ms (as specified in TS 36.133 [4] clause 8.1.2.4.5.2.2.2 for when DRX cycle length > 40 ms)

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 44082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.9 E-UTRAN FDD - UTRAN TDD measurements

8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

8.9.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA TDD cell search requirements.

8.9.1.2 Test applicability

This test applies to all types of release 8 E-UTRA FDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of release 9 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 15 and 22.

This test applies to all types of release 9 and forward E-UTRA FDD UEs that support release 9 and forward UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.9.1.3 Minimum requirement

The measurement reporting delay shall be less than $T_{\text{identify, UTRA\_TDD}}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, UTRA\_TDD}} = Max\left\{5000, T_{\text{basic identify UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

where

$T_{\text{basic\_identify\_UTRA\_TDD}}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Section 9.3 with measurement period given by

$$T_{\text{measurement UTRA\_TDD}} = Max\left\{T_{\text{Measurement\_Period UTRA\_TDD}}, T_{\text{basic measurement UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in section 8.1.2.1.1

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD.}$ Where $X_{basic\ measurementUTRA\_TDD}$= 6.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.9.

8.9.1.4 Test description

8.9.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.
2. The general test parameter settings are set up according to Table 8.9.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.9.1.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.9.1.4.1-1: General test parameters for Event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	E-UTRA FDD Cell 1
Neighbour cell		Cell 2	UTRA TDD Cell 2 is to be identified.
Gap Pattern Id		1	As specified in TS 36.133 section8.1.2.1. Measurement Gap Repetition Period = 80ms
Inter-RAT measurement quantity		UTRA TDD PCCPCH RSCP	
Threshold other system	dBm	-75	UTRA TDD PCCPCH RSCP threshold for event B1.
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
T1	s	5	
T2	s	15	

8.9.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.9.1.5-1 and 8.9.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.9.1.5-1 and 8.9.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 12880 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 4) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall change set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.9.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.9.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.9.1.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	40	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	
}			
}			
}			
}			
hysteresis	0		
}			
}			
}			

Table 8.9.1.4.3-3: *MeasuredResults*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCellsCHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.9.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellIdphysicallCellIdentity CHOICE {			
tdd	UTRA-TDD-CellIdentity		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test		
}			
}			

Table 8.9.1.4.3-5: CellGlobalId-UTRA: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CellGlobalIdUTRA ::= SEQUENCE {			
plmn-Identity	PLMN-Identity		
cellIdentity		BIT STRING (SIZE (28))	
}			

8.9.1.5 Test requirement

Tables 8.9.1.4.1-1, 8.9.1.5-1 and 8.9.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.9.1.5-1: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

N_{oc}	dBm/15KHz	-98	
RSRP	dBm	-94	-94
$\hat{E}_s/I_{ot}$	dB	4	4
P-SCH_RP	dBm	-94	
S-SCH_RP	dBm	-94	
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.9.1.5-2: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell2)

Parameter	Unit	Cell 2			
		T1		T2	
Timeslot Number		0	DwPTS	0	DwPTS
UTRA RF Channel Number (NOTE1)		Channel1			
PCCPCH_Ec/Ior	dB	-Infinity		-3	
DwPCH_Ec/Ior	dB	-Infinity			0
OCNS_Ec/Ior		-Infinity		-3	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity		9	
I_{oc}	dBm/1.28 MHz	-70			
PCCPCH_RSCP	dB	-Infinity		-64	
PropagationCondition		Case 3 (NOTE2)			
NOTE 1: The DPCH of the cell is located in a timeslot other than 0. NOTE 2: Case 3 propagation conditions are specified in TS 25.102 Annex B.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms \backslash$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

8.9.2.1 Test purpose

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN TDD cells. This test will partly verify the Enhanced UTRA TDD cell identification requirements in TS 36.133 [4] section 8.1.2.4.4 under AWGN propagation conditions.

8.9.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bit 15 and 39.

8.9.2.3 Minimum conformance requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length ≤ 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{\text{identify, enhanced\_UTRA\_TDD}}$:

$$T_{\text{identify, enhanced\_UTRA\_TDD}} = (T_{\text{basic\_identify\_enhanced\_UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} + 480) \cdot N_{Freq} \quad ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 500 ms.

A cell shall be considered detectable when:

- P-CCPCH_Ec/Io ≥ -6 dB,
- DwPCH_Ec/Io ≥ -1 dB

When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.4 and A.8.9.2.

8.9.2.4 Test description

8.9.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.
2. The general test parameter settings are set up according to Table 8.9.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.9.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.9.2.4.1-1: General test parameters for E-UTRAN FDD- UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Thresh	dBm	-83	Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Monitored UTRA TDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list
Time offset between cells	ms	3	
T1	s	5	
T2	s	2	

8.9.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.9.2.5-1 and 8.9.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an *RRCConnectionReconfiguration* with Event B1 configured message.

4. The UE shall transmit *RRCConnectionReconfigurationComplete* message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.9.2.5-1 and 8.9.2.5-2. T2 starts.

6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 1122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.9.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.9.2.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.9.2.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	32	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.9.2.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.9.2.4.3-4: *MeasResultListUTRA*: E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.9.2.5 Test requirement

Tables 8.9.2.4.1-1, 8.9.2.5-1 and 8.9.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions test.

Table 8.9.2.5-1: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.9.2.5-2: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 2 (UTRA TDD)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		1			
P-CCPCH_Ec/Ior	dB	-4.77	-4.77		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior[Note2]	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	- infinity	8	- infinity	8
I_{oc}	dBm/1.28 MHz	-79.4			
P-CCPCH RSCP [Note3]	dBm	- infinity	-76.17	n.a.	n.a.
P-CCPCH_Ec/Io [Note3]	dB	- infinity	-5.41	n.a.	n.a.
DwPCH_Ec/Io [Note3]	dB	n.a.	n.a.	- infinity	-0.64
Propagation Condition		AWGN			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: P-CCPCH RSRP, PCCPCH_Ec/Io and DwPCH_Ec/Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, enhanced\_UTRA\_TDD}$

$$T_{identify,\ enhanced\_UTRA\_TDD} = (T_{basic\_identify\_enhanced\_UTRA\_TDD} \cdot \frac{480}{T_{inter1}} + 480) \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_enhanced\_UTRA\_TDD}$ = 80 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 1122 ms in this test case (note: this gives a total of 1120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.10 E-UTRAN TDD - GSM measurements

8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN

8.10.1.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements. This test will partly verify the E-UTRAN TDD - GSM cell search requirements in TS 36.133 [4] section 8.1.2.4.6.

8.10.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 15 and 23.

8.10.1.3 Minimum conformance requirements

The requirements in this section apply only to UE supporting E-UTRAN TDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to TS 36.133 [4] Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in TS 36.133 [4] section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{\text{GSM carrier RSSI}}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{\text{Measurement Period, GSM}}$, for the GSM carrier RSSI measurement is N_{freq}*480 ms. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in TS 36.133 [4] section 8.1.2.4.5.1.2.1.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in TS 36.133 [4] section 8.1.2.4.5.1.2.2.

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to TS 36.133 [4] section 8.1.2.4.5.1 when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.

- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.

- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.

- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re-confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re-confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.10.1.3-1.

Table 8.10.1.3-1: The gap length and maximum time difference for BSIC verification

Gap length [ms]	Maximum time difference [µs]
6	± 2350 µs

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in TS 36.133 [4] section 8.1.2.4.5.1.2

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.10.1.3-2. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.10.1.3-2

Number of carriers other than GSM	$T_{identify,gsm}$(ms)		$T_{reconfirm,gsm}$(ms)	
	40ms gap configuration (ID 0)	80ms gap configuration (ID 1)	40ms gap configuration (ID 0)	80ms gap configuration (ID 1)
0	2160	5280	1920	5040
1	5280	21760	5040	17280
2	5280	31680	5040	29280
3	19440	No requirement	13320	No requirement
4	31680	No requirement	29280	No requirement
5	31680	No requirement	29280	No requirement

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement gap used for GSM BSIC reconfirmation as described in TS 36.133 [4] section 8.1.2.4.5.1.2, the UE shall attempt to decode the BSIC falling within the measurement gap according to table 8.10.1.3 - 2. If more than one BSIC can be decoded within the same measurement gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re\text{-}confirm,GSM}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see TS 36.133 [4] section 8.1.2.4.5.1.2.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see TS 36.133 [4] section 8.1.2.4.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in TS 36.133 [4] section 8.1.2.4.5.1. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.5.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.1 and A8.10.1

8.10.1.4 Test description

8.10.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UEs that support receive diversity.

2. The general test parameter settings are set up according to Table 8.10.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.10.1.4.3.

5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.10.1.4.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	5	

8.10.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table's 8.10.1.5-1 and 8.10.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.10.1.5-1 and 8.10.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 3122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.10.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.10.1.4.3-1: Common Exception messages for E-UTRAN TDD-GSM event triggered reporting in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-10

Table 8.10.1.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.10.1.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN TDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
b1-ThresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB INTEGER(0..30)	
timeToTrigger	ms0		
}			
}			

Table 8.10.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - GSM event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.10.1.4.3-5: *MeasResultListGERAN*: Additional E-UTRAN TDD - GSM event triggered in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId SEQUENCE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.10.1.4.3-6: *CarrierFreqGERAN*: Additional E-UTRAN TDD - GSM event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqGERAN ::= SEQUENCE {			
arfcn		INTEGER (0..1023)	
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
}			

8.10.1.5 Test requirement

The test parameters are given in Tables 8.10.1.4.1-1, 8.10.1.5-1 and 8.10.1.5-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table 8.10.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.10.1.5-2: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The UE shall send one Event B1 triggered measurement report including the valid BSIC of cell # 2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE 1: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM}$ = 2* 480ms =960ms.

Initial BSIC identification delay = 2160 ms.

The overall delays measured shall be less than a total of 3122 ms in this test case (note: this gives 960 ms for measurement reporting delay plus 2160 for BSIC identification and plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

8.10.2.1 Test purpose

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD-GSM cell search requirements when DRX is used in TS 36.133 [4] section 8.1.2.4.6.

8.10.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM. Applicability requires support for FGI bits 5, 15 and 23.

8.10.2.3 Minimum conformance requirements

The requirements in this section apply only to UE supporting E-UTRAN TDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to TS 36.133 [4] Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in TS 36.133 [4] section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is shown in table 8.10.2.3-1. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

Table 8.10.2.3-1: GSM measurement period for large DRX

DRX cycle length (s)	$T_{measure,GSM}$ (s) (DRX cycles)
≤0.04	Non DRX Requirements are applicable
0.04<DRX-cycle≤ 0.08	Note (6*N_{freq})
0.08<DRX-cycle≤ 2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells.
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to TS 36.133 [4] section 8.1.2.4.5.2.1 when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every 30 seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be made on GSM cells that are requested with BSIC verified.

For DRX cycle length ≤ 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section TS 36.133 [4] 8.1.2.4.5.1.2.1 shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every N_{freq}*30s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within N_{freq}*60 s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length ≤ 40 ms, the GSM BSIC re-conformation requirements corresponding to the non DRX requirements as specified in TS 36.133 [4] section 8.1.2.4.5.1.2.2 shall apply.

For DRX cycle length > 40 ms, at least every N_{freq}*30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within N_{freq}*60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see TS 36.133 [4] section 8.1.2.4.5.2.2.1. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see TS 36.133 [4] section 8.1.2.4.5.2.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than 2*$T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in TS 36.133 [4] section 8.1.2.4.5.2.1. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.5.2.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.2 and A8.10.2

8.10.2.4 Test description

8.10.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UEs that support receive diversity.

2. The general test parameter settings are set up according to Table 8.10.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.10.2.4.3.

5. In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in TS 36.133 [4] Table 8.1.2.1-1 is provided. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.10.2.4.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI		
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.10.2.5-2
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1		List of GSM cells provided before T2 starts.
T1	s	5		
T2	s	5	45	

8.10.2.4.2 Test procedure

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table's 8.10.2.5-1 and 8.10.2.5-4. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.10.2.5-1 and 8.10.2.5-4. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 3162 ms for Test1 or less than 44082 ms for Test2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
11. Repeat step 1-10 for each sub-test in Table 8.10.2.4.1-1 as appropriate.

8.10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.10.2.4.3-1: Common Exception messages for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-10 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.10.2.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.10.2.4.3-3: *PRACH-ConfigSIB-DEFAULT*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7a PRACH-ConfigSIB-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigSIB-DEFAULT ::= SEQUENCE {			
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		TDD
}			
}			

Table 8.10.2.4.3-4: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.10.2.4.3-5: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
b1-ThresholdGERAN	30	GERAN-Thres is actual value in dBm	
}			
}			
}			
}			
hysteresis	0	The actual value is IE value * 0.5 dB INTEGER(0..30)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.10.2.4.3-6: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.10.2.4.3-7: *MeasResults*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.10.2.4.3-8: *MeasResultListGERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId SEQUENCE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.10.2.4.3-9: *CarrierFreqGERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqGERAN ::= SEQUENCE {			
arfcn		INTEGER (0..1023)	
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
}			

8.10.2.5 Test requirement

Cell specific test parameters are given in Table 8.10.2.5-1 for E-UTRAN and in Table A.8.10.2.5-4 for GSM. DRX configuration for Test1 and Test2 are given in Table 8.10.2.5-2 and time alignment timer and scheduling request related parameters in Table 8.10.2.5-3.

Table 8.10.2.5-1: Cell specific test parameters for E-UTRAN TDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

$\hat{E}_s/I_{ot}$	dB	4	4
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.10.2.5-2: drx-Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331.			

Table 8.10.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

Table 8.10.2.5-4: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH. In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = 2*$T_{\text{Measurement Period, GSM}}$ + $T_{\text{identify, GSM}}$ + TTI insertion uncertainty + DRX cycle length

$T_{\text{Measurement Period, GSM}}$ = 480 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

$T_{\text{identify, GSM}}$ = 2160 ms (as specified in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.1.2.1)

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3162 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = 2*$T_{\text{Measurement Period, GSM}}$ + N_{freq} * 30s + TTI insertion uncertainty + DRX cycle length

$T_{\text{Measurement Period, GSM}}$ = 6400 ms (as specified in table 8.1.2.4.5.2.1-1 of TS 36.133 [4] clause 8.1.2.4.5.2.1)

N_{freq} = 1 (as specified in TS 36.133 clause 8.1.2.1.1)

N_{freq} * 30 s = 30000 ms (as specified in TS 36.133 [4] clause 8.1.2.4.5.2.2.2 for when DRX cycle length > 40 ms)

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 44082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.11 Monitoring of Multiple Layers

8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions

8.11.1.1 Test purpose

To verify that the UE makes correct reporting of multiple events under fading propagation conditions within the E-UTRA FDD inter-frequency cell search requirements.

8.11.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.11.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{\text{Identify\_Inter}}$ according to the following expression:

$$T_{\text{Identify\_Inter}} = T_{\text{Basic\_Identify\_Inter}} \cdot \frac{480}{T_{\text{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period given by Table 8.11.1.3-1.

Table 8.11.1.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.1.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.11.1.

8.11.1.4 Test description

8.11.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.19.

2. The general test parameter settings are set up according to Table 8.11.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.1.4.3.

5. In this test, there are three E-UTRA cells, cell1, cell2 and cell3, all on different frequencies. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.1.4.1-1: General test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2, 3	Three FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2 and cell 3	Cell 2 is on RF channel number 2 and cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN FDD cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	10	

8.11.1.4.2 Test procedure

This test scenario comprised of 3 E-UTRA FDD cells operating on different frequencies. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 or cell 3. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.1.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.1.5-1.

6. UE shall transmit MeasurementReport messages triggered by event A3 for cell 2 and cell 3, respectively.

6a. If the measurement reporting delay for cell 2 from the beginning of the time period T2 is less than 7682 ms the number of “cell 2 successes” is increased by one.

6b. If the measurement reporting delay for cell 3 from the beginning of time period T2 is less than 7682 ms the number of “cell 3 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-8 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.1.4.3-2: *MeasConfig-DEFAULT*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A3		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		

}			

Table 8.11.1.4.3-3: *ReportConfigEUTRA-A3*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.1.4.3-4: *MeasResults*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.1.4.3-5: *MeasResults*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.1.4.3-6: *MeasResultListEUTRA*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.11.1.5 Test requirement

Table 8.11.1.4.1-1 and 8.11.1.5-1 define the primary level settings including test tolerances for three E-UTRAN FDD cells.

Table 8.11.1.5-1: Cell specific test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading conditions

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD		OP.2 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-98.00	-98.00	-Infinity	-94.40	-Infinity	-94.40
$\hat{E}_s/I_{ot}$	dB	0	0	-Infinity	3.60	-Infinity	3.60
SCH_RP Note 4	dBm/15 kHz	-98.00	-98.00	-Infinity	-94.40	-Infinity	-94.40
$\hat{E}_s/N_{oc}$	dB	0	0	-Infinity	3.60	-Infinity	3.60
Propagation Condition		AWGN		ETU70		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall send one Event A3 triggered measurement report for cell 2 with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The UE shall send one Event A3 triggered measurement report for cell 3 with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for cell 2 and cell 3.

Decide the test pass, if events for cell 2 **and** cell 3 are passed, otherwise fail the UE.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = Measurement reporting delay + TTI insertion uncertainty

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

Therefore, the overall delays measured shall be less than a total of 7682ms in this test case (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

8.11.2.1 Test purpose

To verify that the UE makes correct reporting of two event when doing inter frequency measurements.

8.11.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 25.

8.11.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|$_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- SCH_RP|dBm and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.11.2.3-1.

Table 8.11.2.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

Where:

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.11.2.

8.11.2.4 Test description

8.11.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.19.
2. The general test parameter settings are set up according to Table 8.11.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 8.11.2.4.3.
5. There are three E-UTRA cells, cell1, cell2 and cell3, all on different frequencies in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.2.4.1-1: General test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
E-UTRA RF Channel Number		1, 2, 3	Three TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cells		Cell 2 and Cell 3	Cell 2 and 3 are on RF channel numbers 2 and 3 respectively
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 μs	Synchronous cells 3μs or 92*Ts
T1	s	5	
T2	s	10	

8.11.2.4.2 Test procedure

This test scenario comprised of 3 E-UTRA TDD cells operating on different frequency. The test consists of two successive time periods, with time duration T1 and T2. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.2.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.2.5-1.

6. UE shall transmit two MeasurementReport message triggered by two events A3 for cell 2 and cell 3, respectively.

6a. If the overall delay measured from the beginning of the time period T2 is less than 7682 ms for event A3 for cell 2 report then the number of “cell 2 successes” is increased by one.

6b. If the overall delay measured from the beginning of time period T2 is less than 7682ms for event A3 for cell 3 report then the number of “cell 3 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A3		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		

}			

Table 8.11.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.2.4.3-4: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.2.4.3-5: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.11.2.5 Test requirement

Tables 8.11.2.4.1-1 and 8.11.2.5-1 define the primary level settings including test tolerances for three E-UTRAN TDD cells.

Table 8.11.2.5-1: Cell specific test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions cells

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		OP.2 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-98.00	-98.00	-infinity	-94.40	-infinity	-94.40
$\hat{E}_s/I_{ot}$	dB	0	0	-infinity	3.60	-infinity	3.60
SCH_RP Note 4	dBm/15 kHz	-98.00	-98.00	-infinity	-94.40	-infinity	-94.40
$\hat{E}_s/N_{oc}$	dB	0	0	-infinity	3.60	-infinity	3.60
Propagation Condition		AWGN		ETU70		ETU70	
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for cell 2 and cell 3.

Decide the test pass, if the events for cell 2 and cell 3 are passed, otherwise fail the UE.

8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

8.11.3.1 Test purpose

To verify that the UE makes correct reporting of an event when doing inter frequency and UTRAN FDD measurements under fading propagation conditions.

8.11.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 22, and 25.

8.11.3.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.3 with measurement period given by Table 8.11.3.3-1.

Table 8.11.3.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.3.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.11.3.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable FDD UTRA cell belonging to the monitored set within.

$$\mathrm{T_{identify,\ UTRA\_FDD}} = \mathrm{T_{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T_{inter1}}} \cdot N_{Freq} \quad ms$$

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] section 9.2 with measurement period given by

$$\mathrm{T_{measurement\_UTRA\_FDD}} = Max\left\{\mathrm{T_{Measurement\_Period\ UTRA\_FDD}}, \mathrm{T_{basic\_measurement\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T_{inter1}}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD.}$

$X_{basic\ measurement\ UTRA\_FDD} = 6$

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period $T_{measurement\_UTRA\_FDD}$ for UTRA FDD CPICH measurements.

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] section 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_identify\_enhanced\_UTRA\_FDD}$ = 60 ms. This is the time period used in the inter RAT equation in section 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify, UTRA\_FDD}$ defined in TS 36.133 [4]section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify, enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify, UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify, enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1a for the enhanced requirements and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.2 provided the timing to that cell has not changed more than ± 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.1.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.11.3.

8.11.3.4 Test description

8.11.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.24.

2. The general test parameter settings are set up according to Table 8.11.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.3.4.3.

5. In this test, there are two cells on different carrier frequencies and one cell on UTRAN carrier frequency. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.3.4.1-1: General test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
E-UTRAN FDD measurement quantity		RSRP	
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/N0	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dB	-86	RSRP threshold for event B2.
b2-Threshold-UTRA	dB	-18	CPICH Ec/N0 threshold for event B2.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	8	

8.11.3.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.3.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.3.5-1.

6. UE shall transmit MeasurementReport messages triggered by event A3 and B2.

6a. If the measurement reporting delay for event A3 from the beginning of the time period T2 is less than 7682 ms the number of “A3 successes” is increased by one.

6b. If the measurement reporting delay for event B2 from the beginning of time period T2 is less than 4802 ms the number of “B2 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 primary scrambling code = ((current cell 3 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-8 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(UTRA cell)	
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
eportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		

}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.3.4.3-4: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	55(-86dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in [36.133]	
b2-Threshold2 CHOICE {			
B2-Threshold-UTRA CHOICE {			
thresholdUTRA- EcN0	13 (-18dBm)	UTRA-Thres is actual CPICH Ec/N0 value in dBm	UTRA-FDD
}			
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.11.3.4.3-5 *MeasResults*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[1]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.11.3.4.3-7: *MeasuredResults*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[2]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.11.3.4.3-8: *MeasResultListUTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra- EcN0		Set according to specific test INTEGER (-5..91)	
}			
}			

8.11.3.5 Test requirement

Table 8.11.3.5-1 and 8.11.3.5-2 define the primary level settings including test tolerances for two E-UTRAN FDD cells and one UTRAN FDD cell.

Table 8.11.3.5-1: Cell specific test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-95.05	-95.05	-Infinity	-91.0
$\hat{E}_s/I_{ot}$	dB	2.95	2.95	-Infinity	7.0
SCH_RP Note 4	dBm/15 kHz	-95.05	-95.05	-Infinity	-91.0
$\hat{E}_s/N_{oc}$	dB	2.95	2.95	-Infinity	7.0
Propagation Condition		AWGN		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.11.3.5-2: Cell specific test parameters for UTRAN FDD (cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 3	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 4802 ms from the beginning of time period T2.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 and B2 are passed, otherwise fail the UE.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$\mathrm{T}_{\mathrm{Identify\_Inter}} = \mathrm{T}_{\mathrm{Basic\_Identify\_Inter}} \cdot \frac{480}{\mathrm{T}_{\mathrm{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

Therefore, the overall delays of Event A3 triggered measurement report measured shall be less than a total of 7682ms in this test case (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

Similarly, the overall delays measured test requirement for Event B2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$\mathrm{T}_{\mathrm{identify,\ UTRA\_FDD}} = \mathrm{T}_{\mathrm{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T}_{\mathrm{inter1}}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

Therefore, the overall delays of Event B2 triggered measurement report measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search

8.11.4.1 Test purpose

To verify that the UE makes correct reporting of an event when doing inter frequency measurements and UTRA TDD measurements.

8.11.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 that support UTRA TDD. Applicability requires support for FGI bits 22, and 25.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bits 22, and 25.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bits 39, and 25.

8.11.4.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|$_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.11.4.3-1.

Table 8.11.4.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

Where:

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: [2] x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_TDD.}$

$X_{basic\ measurementUTRA\_TDD} = 6$

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify, UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.

8.11.4.4 Test description

8.11.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.24.

2. The general test parameter settings are set up according to Table 8.11.4.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.4.4.3.

5. There are two E-UTRA TDD cells operating on different frequency and one UTRA TDD cell specified in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.4.4.1-1: General test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cells search under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRA TDD cell is on RF channel number 1
Neighbour cell		Cell 2	E-UTRA TDD cell is on RF channel number 2
		Cell 3	1.28Mcps TDD cell
CP length of cell1 and cell2		Normal	
Uplink-downlink configuration of cell1 and cell2		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Special subframe configuration of cell1 and cell2		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN TDD measurement quantity		RSRP	
UTRAN TDD measurement quantity		RSCP	
DRX		OFF	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hys	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	Parameter for A3 event
Thresh1	dBm	-86	Absolute E-UTRAN RSRP threshold for event B2
Thresh2	dBm	-84	Absolute UTRAN RSCP threshold for event B2
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
Time offset between E-UTRAN TDD cells	µs	3	Synchronous cells
T1	s	>5	During T1, cell 2 and cell 3 shall be powered off. During the off time the physical layer cell identity of cell 2 shall be changed, and the scrambling code of cell 3 shall be changed.
T2	s	15	

8.11.4.4.2 Test procedure

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 UTRA TDD cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.11.4.5-1and Table 8.11.4.5-2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.4.5-1and Table 8.11.4.5-2.
6. UE shall transmit a MeasurementReport message triggered by event A3 and B2.

6a. If the overall delays measured from the beginning of time period T2 is less than 7760 ms for event A3 report then the number of “A3 successes” is increased by one.

6b. If the overall delay measured from the beginning of time period T2 is less than 12.88s for event B2 report then the number of “B2 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 cell parameter id = (current Cell 3 cell parameter id+4) mod 16 for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.4.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.4.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(UTRA cell)	
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		

}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.4.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.4.4.3-4: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-8			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	54(-86dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in [36.133]	
b2-Threshold2 CHOICE {			
B2-Threshold-UTRA CHOICE {			
thresholdUTRA-RSCP	31(UTRA-Thres + 115)	UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.11.4.4.3-5: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.4.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.11.4.4.3-7: *MeasuredResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.11.4.4.3-8: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSRP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.11.4.5 Test requirement

Tables 8.11.4.5-1 and 8.11.4.5-2 define the primary level settings including test tolerances for two E-UTRAN TDD cells and one UTRAN TDD cell.

Table 8.11.4.5-1: Cell specific test parameters for combined E-UTRAN TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
BWchannel	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
$\hat{E}_s/I_{ot}$	dB	2.95	2.95	-Infinity	7.0
$\hat{E}_s/N_{oc}$	dB	2.95	2.95	-Infinity	7.0
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-95.05	-95.05	-Infinity	-91.0
SCH_RP	dBm/15 kHz	-95.05	-95.05	-infinity	-91.0
Propagation Condition		AWGN		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.11.4.5-2: Cell specific test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cell search under fading propagation conditions (cell3)

Parameter	Unit	Cell 3 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number*		Channel 3			
PCCPCH_Ec/Ior	dB	-3			
DwPCH_Ec/Ior	dB			0	
OCNS_Ec/Ior	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	9.0	-Infinity	9.0
I_{oc}	dBm/1.28 MHz	-80.4			
PCCPCH RSCP	dBm	-Infinity	-74.4	n.a.	
Propagation Condition		Case 3			
Note1: The DPCH of all cells are located in a timeslot other than 0. Note2: In the case of multi-frequency network, the UTRA RF Channel Number can be set for the primary frequency in this test. Note3: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

Similarly, the overall delays measured test requirement for Event B2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 1202m8s from the beginning of time period T2 (note: this gives a total of 12.8 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 **and** B2 are passed, otherwise fail the UE.

8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

8.11.5.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements.

8.11.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GSM. Applicability requires support for FGI bit 23, and 25.

8.11.5.3 Minimum conformance requirements

E-UTRAN part:

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|$_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period given by table 8.11.5.3-1.

Table 8.11.5.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.5.3-1.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS 36.133 [4] section 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] section 8.1.2.3.1.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS 36.133 [4] section 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1.

GSM part:

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 of TS 36.133 [4] as:

$$N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm} + N_{freq,\ cdma2000} + N_{freq,\ HRPD}$$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

$N_{freq,\ cdma2000}$ is the number of cdma2000 carriers being monitored

$N_{freq,\ HRPD}$ is the number of HRPD carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

BSIC verification:

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1, 8.1.2.4.5 and A.8.11.5

8.11.5.4 Test description

8.11.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise source and Fader to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.25.

2. The general test parameter settings are set up according to Table 8.11.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.5.4.3.

5. There are two E-UTRA FDD cells operating on different frequency and one GSM cell specified in the test. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.5.4.1-1: General test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
E-UTRAN FDD measurement quantity		RSRP	
Hysteresis	dB	0	Parameter for A3 and B2 event
A3-Offset	dB	-6	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN FDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA Pcell RSRP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	10	

8.11.5.4.2 Test procedure

This test scenario comprised of 2 E-UTRA FDD cells operating on different frequency, and 1 GSM cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.5.5-1and Table 8.11.5.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.5.5-1and Table 8.11.5.5-2.

6. UE shall transmit a MeasurementReport message triggered by event A3 and B2.

6a. If the overall delays measured from the beginning of time period T2 is less than 7682 ms for event A3 report then the number of “A3 successes” is increased by one.

6b. If the overall delays measured from the beginning of time period T2 is less than 7202 ms for event B2 report then the number of “B2 successes” is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. The SS shall set a different BSIC on Cell 3, as the previous timing information of Cell 3 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.5.4.3-1: Common Exception messages for Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.5.4.3-2: *MeasConfig-DEFAULT*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	8 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f3)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f4)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f5)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-	inter frequency	

	GENERIC(f6)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f7)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8	f8 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f8)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-GERAN		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.5.4.3-3: *ReportConfigEUTRA-A3*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.5.4.3-4: *ReportConfigInterRAT-B2-GERAN*: Additional Combined E-UTRAN FDD – E-UTRA FDD Inter-frequency and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7E			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-GERAN(EUTRA-Thres, GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	57(-83dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in TS 36.133 [4]	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-GERAN	30 (-80dBm)		
}			
}			
}			
hysteresis	0 (0 dB)	INTEGER(0..30), 0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.11.5.4.3-5 *MeasResults*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.5.4.3-6: *MeasResultListEUTRA*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.11.5.4.3-7: *MeasuredResults*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.11.5.4.3-8: *MeasResultListGERAN*: Additional Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
measResult SEQUENCE {			
rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

8.11.5.5 Test requirement

Tables 8.11.5.5-1 and 8.11.5.5-2 define the primary level settings including test tolerances for two E-UTRAN FDD cells and one GSM cell.

Table 8.11.5.5-1: Cell specific test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell1 and cell2)

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Cell 1</th><th colspan="2">Cell 2</th></tr>
<tr><th>T1</th><th>T2</th><th>T1</th><th>T2</th></tr>
<tr><td>E-UTRA RF Channel Number</td><td></td><td colspan="2">1</td><td colspan="2">2</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="2">10</td><td colspan="2">10</td></tr>
<tr><td>Correlation Matrix and Antenna Configuration</td><td></td><td colspan="2">1x2 Low</td><td colspan="2">1x2 Low</td></tr>
<tr><td>OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D1.2 (OP.2 FDD)</td><td></td><td colspan="2">OP.1 FDD</td><td colspan="2">OP.2 FDD</td></tr>
<tr><td>PBCH_RA</td><td>dB</td><td colspan="2" rowspan="13">0</td><td colspan="2" rowspan="13">0</td></tr>
<tr><td>PBCH_RB</td><td>dB</td></tr>
<tr><td>PSS_RA</td><td>dB</td></tr>
<tr><td>SSS_RA</td><td>dB</td></tr>
<tr><td>PCFICH_RB</td><td>dB</td></tr>
<tr><td>PHICH_RA</td><td>dB</td></tr>
<tr><td>PHICH_RB</td><td>dB</td></tr>
<tr><td>PDCCH_RA</td><td>dB</td></tr>
<tr><td>PDCCH_RB</td><td>dB</td></tr>
<tr><td>PDSCH_RA</td><td>dB</td></tr>
<tr><td>PDSCH_RB</td><td>dB</td></tr>
<tr><td>OCNG_RA Note 1</td><td>dB</td></tr>
<tr><td>OCNG_RB Note 1</td><td>dB</td></tr>
<tr><td>N_{oc} Note 3</td><td>dBm/15 kHz</td><td colspan="2">-98</td><td colspan="2">-98</td></tr>
<tr><td>RSRP Note 4</td><td>dBm/15 kHz</td><td>-94.20</td><td>-94.20</td><td>-Infinity</td><td>-90.50</td></tr>
<tr><td>$\hat{E}_s/I_{ot}$</td><td>dB</td><td>3.80</td><td>3.80</td><td>-Infinity</td><td>7.50</td></tr>
<tr><td>SCH_RP Note 4</td><td>dBm/15 kHz</td><td>-94.20</td><td>-94.20</td><td>-Infinity</td><td>-90.50</td></tr>
<tr><td>$\hat{E}_s/N_{oc}$</td><td>dB</td><td>3.80</td><td>3.80</td><td>-Infinity</td><td>7.50</td></tr>
<tr><td>Propagation Condition</td><td></td><td colspan="2">ETU70</td><td colspan="2">ETU70</td></tr>
<tr><td colspan="6">Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</td></tr>
</table>

Table 8.11.5.5-2: Cell specific test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell3)

Parameter	Unit	Cell 3	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delays measured test requirement for Event B2 is:

The delay for GSM cell identification with BSIC verified is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = 2*$T_{Measurement\ Period,\ GSM}$ = 2* N_{freq}*480ms = 1920ms.

Initial BSIC identification delay = 5280 ms, when one carrier frequency other than GSM is monitored in the gaps (table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]).

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than 7202ms from the beginning of time period T2 (note: this gives a total of 7200ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 **and** B2 are passed, otherwise fail the UE.

8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

8.11.6.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements.

8.11.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support GSM. Applicability requires support for FGI bit 23, and 25.

8.11.6.3 Minimum conformance requirements

E-UTRAN part:

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clause 9.1.3 with measurement period given by table 8.11.6.3-1.

Table 8.11.6.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional Note 2: T_s is defined in 3GPP TS 36.211 [9]						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS 36.133 [4] section 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] section 8.1.2.3.2.1 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_TDD\ Inter}$ defined in TS 36.133 [4] section 8.1.2.3.2.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

GSM part:

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 of TS 36.133 [4] as:

$N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm} + N_{freq,\ cdma2000} + N_{freq,\ HRPD}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

$N_{freq,\ cdma2000}$ is the number of cdma2000 carriers being monitored

$N_{freq,\ HRPD}$ is the number of HRPD carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

BSIC verification:

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re-confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re-confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{\text{Measurement Period, GSM}}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{\text{Measurement Period, GSM}}$, where $T_{\text{Measurement Period, GSM}}$ is defined in section 8.1.2.4.5.1 of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clauses 8.1.2.3.2, 8.1.2.4.6 and A.8.11.6.

8.11.6.4 Test description

8.11.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator), AWGN noise source and Fader to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.25.

2. The general test parameter settings are set up according to Table 8.11.6.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.6.4.3.

5. There are two E-UTRA TDD cells operating on different frequency and one GSM cell specified in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.6.4.1-1: General test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Special subframe configuration of cell1 and cell2		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration of cell1 and cell2		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
E-UTRAN TDD measurement quantity		RSRP	
Hysteresis	dB	0	Parameter for A3 and B2 event
A3-Offset	dB	-6	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN TDD cells	µs	3	Synchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA Pcell RSRP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	10	

8.11.6.4.2 Test procedure

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 GSM cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.11.6.5-1and Table 8.11.6.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.6.5-1and Table 8.11.6.5-2.

6. UE shall transmit a MeasurementReport message triggered by event A3 and B2.

6a. If the overall delays measured from the beginning of time period T2 is less than 7682 ms for event A3 report then the number of "A3 successes" is increased by one.

6b. If the overall delays measured from the beginning of time period T2 is less than 7202 ms for event B2 report then the number of "B2 successes" is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. The SS shall set a different BSIC on Cell 3, as the previous timing information of Cell 3 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved. The pass/ fail decisions are done separated for procedure steps 6a) and 6b). In general the number of repetitions up to the decision are different for 6a) and 6b). If one of 6a) or 6b) is passed, steps 1-9 are repeated, however the counter for the passed event is not anymore served. If one of 6a) or 6b) is failed, the test can be stopped.

8.11.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.6.4.3-1: Common Exception messages for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.6.4.3-2: *MeasConfig-DEFAULT*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	8 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA serving cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(E-UTRA inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f3)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f4)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f5)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-	inter frequency	

	GENERIC(f6)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f7)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8	f8 is the frequency of the neighbouring cell(GERAN cell)	
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f8)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-GERAN		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-B2		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.6.4.3-3: *ReportConfigEUTRA-A3*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.6.4.3-4: *ReportConfigInterRAT-B2-GERAN*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-7E			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-GERAN(EUTRA-Thres, GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	57(-83dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in TS 36.133 [4]	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-GERAN	30 (-80dBm)		
}			
}			
}			
hysteresis	0 (0 dB)	INTEGER(0..30), 0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.11.6.4.3-5 *MeasResults*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.6.4.3-6: *MeasResultListEUTRA*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.11.6.4.3-7: *MeasuredResults*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.11.6.4.3-8: *MeasResultListGERAN*: Additional Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
measResult SEQUENCE {			
rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

8.11.6.5 Test requirement

Tables 8.11.6.5-1 and 8.11.6.5-2 define the primary level settings including test tolerances for two E-UTRAN TDD cells and one GSM cell.

Table 8.11.6.5-1: Cell specific test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98		-98	
RSRP Note 4	dBm/15 kHz	-94.20	-94.20	-Infinity	-90.50
$\hat{E}_s/I_{ot}$	dB	3.80	3.80	-Infinity	7.50
SCH_RP Note 4	dBm/15 kHz	-94.20	-94.20	-Infinity	-90.50
$\hat{E}_s/N_{oc}$	dB	3.80	3.80	-Infinity	7.50
Propagation Condition		ETU70		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.11.6.5-2: Cell specific test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell3)

Parameter	Unit	Cell 3	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7682 ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delays measured test requirement for Event B2 is:

The delay for GSM cell identification with BSIC verified is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = 2*$T_{Measurement\ Period,\ GSM}$ = 2* N_{freq}*480ms = 1920ms.

Initial BSIC identification delay = 5280 ms, when one carrier frequency other than GSM is monitored in the gaps (table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]).

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than 7202 ms from the beginning of time period T2 (note: this gives a total of 7200 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

The statistical pass/ fail decisions are done separated for event A3 and event B2.

Decide the test pass, if events A3 **and** B2 are passed, otherwise fail the UE.

8.12 Void

8.13 Void

8.14 E-UTRAN TDD - FDD Inter-frequency Measurements

8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.14.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA TDD-FDD inter-frequency cell search requirements. This test will partly verify the TDD-FDD inter-frequency cell search requirements in section 8.1.2.3.3.

8.14.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bit 25.

8.14.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period given by table 8.14.1.3-1.

Table 8.14.1.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.14.1.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.14.1.

8.14.1.4 Test description

8.14.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.14.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.14.1.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.14.1.4.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell1 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
Cell1 Uplink-downlink configuration		1	As specified in TS 36.211 section 4.2 Table 4.2-2.
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 1 E-UTRA TDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA FDD RF Channel Number		2	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133[4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	5	

8.14.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #0 is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.14.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.14.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.14.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.14.1.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.14.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.14.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.14.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.14.1.5 Test requirement

Tables 8.14.1.4.1-1 and 8.14.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous TDD-FDD inter frequency cells test.

Table 8.14.1.5-1: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.1.2 (OP.2 FDD)		OP.1 TDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4.00	4.00	-Infinity	7.70
SCH_RP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.14.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA TDD-FDD inter-frequency cell search requirements.

8.14.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5 and 25.

8.14.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ as shown in table 8.14.2.3-1:

Table 8.14.2.3-1: Requirement to identify a newly detectable FDD inter-frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.256	5.12*N_{freq} (20*N_{freq})	7.68*N_{freq} (30*N_{freq})
0.32	6.4*N_{freq} (20*N_{freq})	7.68*N_{freq} (24*N_{freq})
0.32 < DRX-cycle ≤ 2.56	Note (20*N_{freq})	Note (20*N_{freq})
Note: Time depends upon the DRX cycle in use		

The non DRX requirements in TS 36.133 [4] clause 8.1.2.3.1.1 states that when measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- SCH_RP|$_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.14.2.3-2.

Table 8.14.2.3-2: Requirement to measure FDD inter-frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.08 < DRX-cycle ≤ 2.56	Note (5*N_{freq})
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.3.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.3.2 and A.8.14.2.

8.14.2.4 Test description

8.14.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.14.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.14.2.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.14.2.4.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
Cell1 PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
Cell1PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Cell2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1. Note that UE may only be allocated at *On Duration*
Cell2PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
E-UTRA RF Channel Number		1		one TDD carrier frequencies is used.
E-UTRA RF Channel Number		2		one FDD carrier frequencies is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133[4] section 8.1.2.1.
Cell1 Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Cell1 Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.14.2.5-2
Time offset between cells		3 ms		Asynchronous cells
T1	s	5		
T2	s	5	30	

8.14.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.14.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.14.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.14.2.4.1-1 as appropriate.

8.14.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.14.2.4.3-1: Common Exception messages for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.14.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.14.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.14.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	2		
dsr-TransMax	n4		
}			
}			

Table 8.14.2.4.3-5: *MeasResults*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.14.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.14.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.14.2.5 Test requirement

Tables 8.14.2.4.1-1, 8.14.2.5-1, 8.14.2.5-2 and 8.14.2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.14.2.5-1: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.1.2 (OP.2 FDD)		OP.1 TDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.70
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.70
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.14.2.5-2: DRX-Configuration to be used in E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.14.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN TDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	2	2	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty+ DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delays measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.14.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delays measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.14.3.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.14.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward with support of inter-frequency SI acquisition for HO. Applicability requires support for FGI bit 25.

8.14.3.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify\_CGI,inter} = T_{basic\_identify\_CGI,inter} \quad ms$$

Where

$T_{basic\_identify\_CGI, inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.4 for a corresponding Band

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to TS 36.331[5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, no measurement gaps are configured, and TDD configuration as in TS36.133 [4] Table 8.1.2.3.2.1-1 is used, the UE shall have more than 30 ACK/NACK transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.6 and A.8.14.3.

8.14.3.4 Test description

8.14.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 8.14.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.14.3.4.3.

5. There is one E-UTRA TDD carrier and one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.14.3.4.1-1: General test parameters for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
Cell1PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Cell2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell1 E-UTRA RF channel number		1	One TDD carrier is used
Cell2 E-UTRA RF channel number		2	One FDD carrier is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Cell1 special subframe configuration		6	As specified in table 4.2-1 in TS 36.211[9].
Cell1 Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211[9].
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1 [5].
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331[5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.14.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.14.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.14.3.5-1.
6. The UE shall transmit a MeasurementReport message triggered by Event A3.
7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.14.3.4.3-6.
8. The UE shall transmit RRCConnectionReconfigurationComplete message.
9. The SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.
10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to the UE.
11. The UE shall transmit RRCConnectionReconfigurationComplete message.
12. The UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 42 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.
13. After the SS receive the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.14.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.14.3.4.3-1: Common Exception messages for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.14.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.14.3.4.3-3: *MeasResults*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.14.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.14.3.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.14.3.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
release	NULL		
}			

Table 8.14.3.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity of cell 2		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.14.3.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.14.3.4.3-9: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.14.3.4.3-10: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.14.3.4.3-11: *MeasResults*: Additional E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

8.14.3.5 Test requirement

Tables 8.14.3.4.1-1 and 8.14.3.5-1 define the primary level settings including test tolerances for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.14.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.1.2 (OP.2 FDD)		OP.1 TDD	OP.1 TDD	OP.1 TDD	OP.2 FDD	OP.2 FDD	OP.2 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Test requirement = RRC Procedure delay + $T_{identify\_CGI,\ inter}$ + TTI insertion uncertainty

RRC procedure delay=15ms

$$T_{identify\_CGI,\ inter} = T_{basic\_identify\_CGI,\ inter} \quad ms$$

$T_{basic\_identify\_CGI,\ intra}$ = 150 ms

TTI insertion uncertainty = 2 ms

The overall delays measured is 167 ms, allow 170 ms. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 42 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 42 ACK/NACK number is caused by two parts. Firstly, at least 30 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133 [4] Section 8.1.2.3.7.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 12 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.15 E-UTRAN FDD - TDD Inter-frequency Measurements

8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.15.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD - TDD inter-frequency cell search requirements. This test will verify the FDD-TDD inter-frequency cell search requirements in section 8.1.2.3.4.

8.15.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bit 25.

8.15.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$\mathrm{T}_{\mathrm{Identify\_Inter}} = \mathrm{T}_{\mathrm{Basic\_Identify\_Inter}} \cdot \frac{480}{\mathrm{T}_{\mathrm{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.15.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	

0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.4 and A.8.15.1.

8.15.1.4 Test description

8.15.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.15.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.15.1.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.15.1.4.1-1: General test parameters for E-UTRAN FDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in TS 36.133 section 8.1.2.1.
Cell2 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. Applicable to Cell 2.
Cell2 Uplink-downlink configuration		1	As specified in TS 36.211 section 4.2 Table 4.2-2. Applicable to Cell 2.
CP length		Normal	
Cell 1 E-UTRA FDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA TDD RF Channel Number		2	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	10	

8.15.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #1is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.15.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.15.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.15.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.15.1.4.3-1: Common Exception messages for Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.15.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.15.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.15.1.5 Test requirement

Tables 8.15.1.4.1-1 and 8.15.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous FDD-TDD inter frequency cells test.

Table 8.15.1.5-1: Cell specific test parameters for E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD) and in D.2.2 (OP.2 TDD)		OP.1 FDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

$\hat{E}_s/I_{ot}$	dB	4.00	4.00	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
SCH_RP Note 4	dBm/15 kHz	-94.00	-94.00	-infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 7680 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.15.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-TDD inter-frequency cell search requirements.

8.15.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 5 and 25.

8.15.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.15.2.3-1.

Table 8.15.2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.4.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.4.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.15.2.3-2.

Table 8.15.2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.84	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.4.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.4.2 and A.8.15.2.

8.15.2.4 Test description

8.15.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.15.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.15.2.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.15.2.4.1-1: General test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2 Note that UE may only be allocated at *On Duration*
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2
Cell 1 E-UTRA FDD RF Channel Number		1		One FDD carrier frequency is used.
Cell 2 E-UTRA TDD RF Channel Number		2		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
Cell 2 Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211
Cell 2 Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211
E-UTRA TDD PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
E-UTRA TDD Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.15.2.5-2
Time offset between cells	ms	3		Asynchronous cells
T1	s	5		
T2	s	5	30	

8.15.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.15.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.15.2.5-1.

6. The UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.15.2.4.1-1 as appropriate.

8.15.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.15.2.4.3-1: Common Exception messages for Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.15.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.15.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.15.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.15.2.4.3-5: *MeasResults:* Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.15.2.4.3-7: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.15.2.5 Test requirement

Tables 8.15.2.5-1, 8.15.2.5-2 and 8.15.2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.15.2.5-1: Cell specific test parameters for E-UTRAN FDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.1.1 (OP.1 FDD) and in D.2.2 (OP.2 TDD)		OP.1 FDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

$\hat{E}_s/I_{ot}$	dB	4.00	4.00	-Infinity	7.70
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94.00	-94.00	-Infinity	-90.30
SCH_RP Note 4	dBm/15 kHz	-94.00	-94.00	-infinity	-90.30
$\hat{E}_s/N_{oc}$	dB	4.00	4.00	-Infinity	7.70
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.15.2.5-2: DRX-Configuration to be used in E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.15.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213 [8].

In Test1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.TTI insertion uncertainty = 2 ms.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$\mathrm{T}_{\mathrm{Identify\_Inter}} = \mathrm{T}_{\mathrm{Basic\_Identify\_Inter}} \cdot \frac{480}{\mathrm{T}_{\mathrm{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.15.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

8.15.3.1 Test purpose

To verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps.

8.15.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward with support of inter-frequency SI acquisition for HO. Applicability requires support for FGI bit 25.

8.15.3.3 Minimum conformance requirements

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of TS 36.331 [5]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$\mathrm{T}_{\mathrm{identify\_CGI,inter}} = \mathrm{T}_{\mathrm{basic\_identify\_CGI,inter}} \quad ms$$

Where

$T_{basic\_identify\_CGI, inter}$ = 150 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined, provided that the E-UTRA cell has been already identified by the UE.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in TS 36.133[4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.4 for a corresponding Band.

The MIB of an E-UTRA cell whose CGI is identified shall be considered decodable by the UE provided the PBCH demodulation requirements are met according to TS 36.331[5].

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic\_identify\_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [5] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than 60 ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.8 and A.8.15.3.

8.15.3.4 Test description

8.15.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 8.15.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.15.3.4.3.

5. There is one E-UTRA FDD carrier and one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.15.3.4.1-1: General test parameters for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
Cell1 PDSCH parameters		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
Cell1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Cell2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF channel number		1, 2	One FDD and one TDD carrier frequency are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Cell 2 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211[9].
Cell 2 Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211[9].
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331[5].
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

8.15.3.4.2 Test procedure

The test comprises of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.15.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration with event A3 configured message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.15.3.5-1.

6. The UE shall transmit a MeasurementReport message triggered by Event A3.

7. The SS shall transmit an RRCConnectionReconfiguration message during period T2. The RRC message shall release MeasGapConfig according to Table 8.15.3.4.3-6.

8. The UE shall transmit RRCConnectionReconfigurationComplete message.

9. The SS shall transmit an RRCConnectionReconfiguration message during period T2, The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE.

10. The SS shall start T3 timer when the last TTI containing the RRC message implying SI reading is sent to the UE.

11. The UE shall transmit RRCConnectionReconfigurationComplete message.

12. The UE shall transmit a MeasurementReport message containing the cell global identifier of cell 2 within 170 milliseconds from the start of T3. The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 80 ACK/NACK shall be detected as being transmitted by the UE. If the overall delays measured from the beginning of time period T3 is less than 170 ms, and the UE have more than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of successful tests is increased by one. If the UE fails to report the cell global identifier within the overall delays measured requirement, or the UE have less than 80 ACK/NACKs transmitted from the start of T3 until 170 ms, then the number of failure tests is increased by one.

13. After the SS receives the MeasurementReport message (in step 12) or when T3 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

14. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

15. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

16. Repeat step 2-15 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.15.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.15.3.4.3-1: Common Exception messages for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-9

Table 8.15.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.15.3.4.3-3: *MeasResults*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step6)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.15.3.4.3-5: *ReportConfigEUTRA-PERIODICAL*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportCGI		
}			
}			
reportAmount	1		
si-RequestForHO-r9	setup		
}			

Table 8.15.3.4.3-6: MeasGapConfig- Additional E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step7)

Derivation Path: 36.331, clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= CHOICE {			
Release	NULL		
}			

Table 8.15.3.4.3-7: *MeasResultListEUTRA*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE{			
cellGlobalId SEQUENCE{			
plmn-Identity	plmn-Identity		
cellIdentity	cellIdentity		
}			
trackingAreaCode			
plmn-IdentityList			
}			
}			

Table 8.15.3.4.3-8: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
}			
MeasObjectEUTRA-GENERIC(f2) ::= SEQUENCE {		f2 is the frequency of the neighbouring cell	
cellForWhichToReportCGI	Physical Cell ID of Cell 2		
}			

Table 8.15.3.4.3-9: *SystemInformationBlockType2*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.15.3.4.3-10: *SystemInformationBlockType5*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig[*n*]	01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
}			

Table 8.15.3.4.3-11: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.15.3.4.3-12: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step9)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-P		
}			
}			

Table 8.15.3.4.3-13: *MeasResults*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step12)

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.15.3.4.3-14: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test requirement (step3)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(f1) ::= SEQUENCE {		f1 is the frequency of the serving cell	
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		
}			

8.15.3.5 Test requirement

Tables 8.15.3.4.1-1 and 8.15.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps test.

Table 8.15.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.2.2 (OP.2 TDD)		OP.10 FDD	OP.10 FDD	OP.10 FDD	OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

Test requirement = RRC Procedure delay + $T_{identify\_CGI, inter}$ + reporting delay

= 15 + 150 + 2ms from the start of T3

= 167 ms, allow 170 ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until 170 ms at least 60 ACK/NACK shall be detected as being transmitted by the UE.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The overall 80 ACK/NACK number is caused by two parts. Firstly, at least 60 ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in TS 36.133[4] Section 8.1.2.3.5.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional 20 ACK/NACK shall be sent from the start of T3 until 170 ms excludes 150 ms for identifying the cell global identifier of cell 2.

8.16 E-UTRAN Carrier Aggregation Measurements

8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX

8.16.1.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.1.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.1.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated SCell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.1.

8.16.1.4 Test description

8.16.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.1.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.1.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×measCycleSCell)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.1.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.1.4.3.

4. Set the parameters according to T1 in Table 8.16.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.1.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.1.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.1.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.1.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.1.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.16.1.4.3-4: *MeasConfig:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.1.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.1.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-93)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.1.4.3-7: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.16.1.4.3-8: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.1.5 Test requirement

Table 8.16.1.4-1 and Table 8.16.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.1.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined inD.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.96	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
Propagation Condition		ETU70								

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc}$

$T_{identify\_scc}$ = 20 *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX

8.16.2.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.2.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.2.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.2.

8.16.2.4 Test description

8.16.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.2.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.2.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.2.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.2.4.3.

4. Set the parameters according to T1 in Table 8.16.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.2.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.2.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2” is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.2.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.2.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.2.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.16.2.4.3-4: *MeasConfig:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.2.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.2.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.2.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.16.2.4.3-8: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.2.5 Test requirement

Table 8.16.2.4-1 and Table 8.16.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.2.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.96	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
Propagation Condition		ETU70								
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.										

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc}$

$T_{identify\_scc}$ = 20 *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

8.16.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA FDD-FDD measurements of the secondary component carrier cell search requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.3.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.3.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.3.

8.16.3.4 Test description

8.16.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.3.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.3.4.1-1: General test parameters for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	1280	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.3.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.3.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.3.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

Table 8.16.3.4.3-2: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.3.4.3-3: *SystemInformationBlockType2*: Additional E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.3.4.3-4: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.3.5 Test requirement

Table 8.16.3.4.1-1 and Table 8.16.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.3.5-1: Cell specific test parameters for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	10		10		10	
OCNG Pattern defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD		OP.2 FDD		OP.2 FDD	
Timing offset to Cell1	µs	-		0		3	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Propagation Condition		AWGN					
NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. NOTE 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 25.6s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

8.16.4.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA TDD-TDD measurements of the secondary component carrier cell search requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.4.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.4.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.4.

8.16.4.4 Test description

8.16.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.4.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.4.4.1-1: General test parameters for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211 [8] The same configuration applies to all cells
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 in TS 36.133 [4] into account plus margin
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	1280	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.4.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.4.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.4.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receive the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.4.4.3-1: Common Exception messages for E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

8.16.4.5 Test requirement

Table 8.16.4.4.1-1 and Table 8.16.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.16.4.5-1: Cell specific test parameters for E-UTRAN TDD-TDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	10		10		10	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		OP.2 TDD	
Timing offset to Cell1	µs	-		0		3	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-82	-82	-82	-82	-Infinity	-82
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Propagation Condition		AWGN					

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 25.6s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth

8.16.5.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.5.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.5.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*.

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.5.

8.16.5.4 Test description

8.16.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.5.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.5.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.4 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.10 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)		MHz	20	Channel bandwidth for cells on primary and secondary component carriers
A2	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
Note 1: See Table 8.16.1.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.5.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.5.4.3.

4. Set the parameters according to T1 in Table 8.16.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.5.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.5.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 2 A2" is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.5.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.5.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.5.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2	n100	
}			
}			

Table 8.16.5.4.3-4: *MeasConfig:* Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.5.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.5.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.5.4.3-7: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell ::= SEQUENCE {		Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.16.5.4.3-8: *MeasurementReport*: Additional E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.5.5 Test requirement

Table 8.16.5.4-1 and Table 8.16.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20 MHz channel BW.

Table 8.16.5.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20			20		
OCNG Patterns defined in A.3.2.1.11 (OP.11 FDD) and in A.3.2.1.12 (OP.12 FDD)		OP.11 FDD			OP.12 FDD			OP.12 FDD		
N_{oc} Note 2	dBm/15 kHz	-104			-104.1					
RSRP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/I_{ot}$	dB	19.2	19.2	-3	19.3	0.25	-4.86	-infinity	-0.35	-4.73
SCH_RP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/N_{oc}$	dB	19.2	19.2	-3	19.3	19.3	-3.1	-infinity	19	-3
Note: See Table 8.16.1.5.1-1 for other cell-specific test parameters.										

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc.}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay = $T_{identify\_scc.}$

$T_{identify\_scc}$ = 20 *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth

8.16.6.1 Test purpose

To verify the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements in TS 36.133[4] section 8.3.3.2.1.

8.16.6.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.6.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell.This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.6.

8.16.6.4 Test description

8.16.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.6.4.3.

5. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.6.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)		MHz	20	Channel bandwidth for cells on primary and secondary component carriers
A2	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.11.1 into account plus margin.
Note 1: See Table 8.16.2.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.16.6.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.6.4.3.

4. Set the parameters according to T1 in Table 8.16.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.6.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event "A6". Otherwise count a fail for the event "A6".

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.6.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2” is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.6.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6

Table 8.16.6.4.3-2: *SCellToAddMod-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.16.6.4.3-3: *RadioResourceConfigCommonSCell-r10:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2	n100	
}			
}			

Table 8.16.6.4.3-4: *MeasConfig:* Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements, 20 MHz

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.16.6.4.3-5: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.16.6.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.6.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.16.6.4.3-8: *MeasurementReport*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz requirements

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.16.6.5 Test requirement

Table 8.16.6.4-1 and Table 8.16.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell in non-DRX test under fading propagation conditions for 20 MHz channel BW.

Table 8.16.6.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions, 20 MHz

Parameter	**Unit**	**Cell 1**			**Cell 2**			**Cell 3**		
		T1	**T2**	**T3**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**
$BW_{channel}$	MHz	20			20			20		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8 TDD)		OP.7 TDD			OP.8 TDD			OP.8 TDD		
N_{oc} Note 2	dBm/15 kHz	-104			-104.1					
RSRP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/I_{ot}$	dB	19.2	19.2	-3	19.3	0.25	-4.86	-infinity	-0.35	-4.73
SCH_RP Note 3	dBm/15 kHz	-84.8	-84.8	-107	-84.8	-84.8	-107.2	-infinity	-85.1	-107.1
$\hat{E}_s/N_{oc}$	dB	19.2	19.2	-3	19.3	19.3	-3.1	-infinity	19	-3
Note: See Table 8.16.2.5-1 for other cell-specific test parameters.										

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface.

The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc}$

$T_{identify\_scc}$ = 20 *measCycleSCell*

measCycleSCell = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc}$

where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 **and** A2 are passed, otherwise fail the UE.

8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth

8.16.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA FDD measurements of the secondary component carrier cell search requirements in TS 36.133[4] section 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

8.16.7.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.7.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell. This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.7.

8.16.7.4 Test description

8.16.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.7.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.7.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.7.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	20	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.3.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.7.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.7.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.7.5-1.

8. UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.7.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX, 20 MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

Table 8.16.7.4.3-2: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements, 20 MHz

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.7.4.3-3: *SystemInformationBlockType2*: Additional E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements, 20 MHz

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.7.4.3-4: *SystemInformationBlockType3*: Additional E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX test requirements, 20 MHz

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.7.5 Test requirement

Table 8.16.7.4.1-1 and Table 8.16.7.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test for 20 MHz channel bandwidth.

Table 8.16.7.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	20		20		20	
OCNG Patterns defined in D.1.17 (OP.17 FDD) and in D.1.12 (OP.12 FDD)		OP.17 FDD		OP.12 FDD		OP.12 FDD	
N_{oc} Note 3	dBm/15 kHz	-101		-101			
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Note: See Table 8.16.3.5-1 for other cell-specific test parameters.							

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = 25.6s
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.8 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth

8.16.8.1 Test purpose

To verify the UE's ability to make a correct reporting of an event on deactivated SCell with PCell interruption in non-DRX within the E-UTRA TDD measurements of the secondary component carrier cell search requirements in TS 36.133[4] section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.8.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA with 20 MHz channel bandwidth for both PCell and SCell. Applicability requires support for FGI bit 111.

8.16.8.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on an SCC with deactivated SCell. This may cause interruptions on PCell that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.8.

8.16.8.4 Test description

8.16.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.8.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.8.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.8.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)	MHz	20	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.4.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.8.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 3. Starting T2, Cell 3 becomes detectable and the UE is expected to detect and send a measurement report. The UE shall be scheduled on PCell continuously throughout the test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.8.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.8.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 25602 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator then the number of failure tests is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.16.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.8.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX, 20 MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-2 Table H.4.1-3 Table H.4.1-5 Table H.4.1-6

T

8.16.8.5 Test requirement

Table 8.16.8.4.1-1 and Table 8.16.8.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test for 20 MHz channel bandwidth.

Table 8.16.8.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX, 20 MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	20		20		20	
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8 TDD)		OP.7 TDD		OP.8 TDD		OP.8 TDD	
N_{oc} Note 3	dBm/15 kHz	-101		-101			
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-Infinity	-0.11
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-Infinity	16
Note: See Table 8.16.4.5-1 for other cell-specific test parameters.							

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 25602 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 3.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 25.6s

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 25602 ms in this test case (note: this gives a total of 25.6s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz

8.16.9.1 Test purpose

Same test purpose as in clause 8.16.1.1.

8.16.9.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.9.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.1.3.

8.16.9.4 Test description

8.16.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for cells on the PCC and 5 MHz for cells on the SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.9.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.9.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carriers ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary carriers
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary carriers
Note 1: See Table 8.16.1.4.1-1 for the other general parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.9.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of Table 8.16.1.4.3 → use Table 8.16.9.4.3.

- Instead of Table 8.16.1.5-1 → use Table 8.16.9.5-1.

8.16.9.4.3 Message contents

Same message contents as in clause 8.16.1.4.3.

8.16.9.5 Test requirement

Same test requirement as in clause 8.16.1.5 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 → use Table 8.16.9.4.1-1.

- Instead of Table 8.16.1.5-1 → use Table 8.16.9.5-1.

Table 8.16.9.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			5			5		
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD			N/A			N/A		
PDSCH allocation	n_{PRB}	13—36			N/A			N/A		
PCFICH/PDCCH/PHICH parameters defined in A.2.1		R.6 FDD			R.11 FDD			R.11 FDD		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.16 (OP.16 FDD)		OP.1 FDD			OP.16 FDD			OP.16 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz

8.16.10.1 Test purpose

Same test purpose as in clause 8.16.2.1.

8.16.10.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.2.3.

8.16.10.4 Test description

8.16.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz for cells on PCC, 5 MHz for cells on SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.10.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.10.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell 3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.10.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carriers ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary carriers
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary carriers
Note 1: See Table 8.16.2.4.1-1 for the other general parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.10.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of Table 8.16.2.4.3 → use Table 8.16.10.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.10.5-1.

8.16.10.4.3 Message contents

Same message contents as in clause 8.16.2.4.3.

8.16.10.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.10.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.10.5-1.

Table 8.16.10.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 10MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			5			5		
PDSCH Reference measurement channel defined in A.1.2		R.0 TDD			N/A			N/A		
PDSCH allocation	n_{PRB}	13—36			N/A			N/A		
PCFICH/PDCCH/PHICH parameters defined in A.2.2		R.6 TDD			R.12 TDD			R.12 TDD		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	μs	-			0			3		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.10 (OP.10 TDD)		OP.1 TDD			OP.10 TDD			OP.10 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

8.16.11.1 Test purpose

Same test purpose as in clause 8.16.3.1.

8.16.11.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.11.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.3.3.

8.16.11.4 Test description

8.16.11.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for cells on PCC, 5 MHz for cells on SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.11.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.11.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.11.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.3 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.11 FDD	As specified in section A.2.1
Note 1: See Table 8.16.3.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.11.4.2 Test procedure

Same test procedure as in clause 8.16.3.4.2 with the following exceptions:

- Instead of Table 8.16.3.4.3 → use Table 8.16.11.4.3.
- Instead of Table 8.16.3.5-1 → use Table 8.16.11.5-1.

8.16.11.4.3 Message contents

Same message contents as in clause 8.16.3.4.3.

8.16.11.5 Test requirement

Same test requirement as in clause 8.16.3.5 with the following exceptions:

- Instead of Table 8.16.3.4.1-1 → use Table 8.16.11.4.1-1.
- Instead of Table 8.16.3.5-1 → use Table 8.16.11.5-1.

Table 8.16.11.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	10		5		5	
OCNG Patterns defined in D.1.10 (OP.10 FDD) and D.1.16 (OP.16 FDD)		OP.10 FDD		OP.16 FDD		OP.16 FDD	
Note: See Table 8.16.3.5-1 for other cell-specific test parameters.							

8.16.12 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

8.16.12.1 Test purpose

Same test purpose as in clause 8.16.4.1.

8.16.12.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA. Applicability requires support for FGI bit 111.

8.16.12.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.4.3.

8.16.12.4 Test description

8.16.12.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for cells on PCC, 5 MHz for cells on SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.12.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.12.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.12.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.11 TDD	As specified in section A.2.2
Note 1: See Table 8.16.4.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.12.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of Table 8.16.4.4.3 → use Table 8.16.12.4.3.

- Instead of Table 8.16.4.5-1 → use Table 8.16.12.5-1.

8.16.12.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.12.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.12.4.1-1.
- Instead of Table 8.16.4.5-1 → use Table 8.16.12.5-1.

Table 8.16.12.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	10		5		5	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.10 (OP.10 TDD)		OP.1 TDD		OP.10 TDD		OP.10 TDD	
Note: See Table 8.16.4.5-1 for other cell-specific test parameters.							

8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz

8.16.13.1 Test purpose

Same test purpose as in clause 8.16.1.1.

8.16.13.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.13.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.1.3.

8.16.13.4 Test description

8.16.13.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.13.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.13.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell3 is the neighbouring cell of Cell 2 on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.13.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary component carrier
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
Note 1: See Table 8.16.1.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.13.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of Table 8.16.1.4.3 → use Table 8.16.13.4.3.
- Instead of Table 8.16.1.5-1 → use Table 8.16.13.5-1.

8.16.13.4.3 Message contents

Same message contents as in clause 8.16.1.4.3.

8.16.13.5 Test requirement

Same test requirement as in clause 8.16.1.5 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 → use Table 8.16.13.4.1-1.
- Instead of Table 8.16.1.5-1 → use Table 8.16.13.5-1.

Table 8.16.13.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined inD.1.15 (OP.15 FDD) and in D.1.16 (OP.16 FDD)		OP.15 FDD			OP.16 FDD			OP.16 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz bandwidth

8.16.14.1 Test purpose

Same test purpose as in clause 8.16.2.1.

8.16.14.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.14.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.2.3.

8.16.14.4 Test description

8.16.14.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.14.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.14.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell 3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.14.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4.TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary component carrier
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on secondary component carrier
Note 1: See Table 8.16.2.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.14.4.2 Test procedure

Same test procedure as in clause 8.16.2.4.2 with the following exceptions:

- Instead of Table 8.16.2.4.3 → use Table 8.16.14.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.14.5-1.

8.16.14.4.3 Message contents

Same message contents as in clause 8.16.2.4.3.

8.16.14.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.14.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.14.5-1.

Table 8.16.14.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 5MHz+5MHz bandwidth

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and in D.2.10 (OP.10 TDD)		OP.9 TDD			OP.10 TDD			OP.10 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	0.15	-4.76	-infinity	-0.25	-4.70
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.00	-infinity	-82.00	-104.00
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.00	-infinity	19.00	-3.00
Propagation Condition		ETU70								

NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

8.16.15.1 Test purpose

Same test purpose as in clause 8.16.3.1.

8.16.15.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.15.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.3.3.

8.16.15.4 Test description

8.16.15.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.15.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.15.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.15.4.1-1: General test parameters for E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in section A.2.1
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.3.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.15.4.2 Test procedure

Same test procedure as in clause 8.16.3.4.2 with the following exceptions:

- Instead of Table 8.16.3.4.3 → use Table 8.16.15.4.3.
- Instead of Table 8.16.3.5-1 → use Table 8.16.15.5-1.

8.16.15.4.3 Message contents

Same message contents as in clause 8.16.3.4.3.

8.16.15.5 Test requirement

Same test requirement as in clause 8.16.3.5 with the following exceptions:

- Instead of Table 8.16.3.4.1-1 → use Table 8.16.15.4.1-1.
- Instead of Table 8.16.3.5-1 → use Table 8.16.15.5-1.

Table 8.16.15.5-1: Cell specific test parameters for E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	5		5		5	
OCNG Patterns defined in D.1.20 (OP.20 FDD) and in D.1.16 (OP.16 FDD)		OP.20 FDD		OP.16 FDD		OP.16 FDD	
Note: See Table 8.16.3.5-1 for other cell-specific test parameters.							

8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth

8.16.16.1 Test purpose

Same test purpose as in clause 8.16.4.1.

8.16.16.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.16.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.4.3.

8.16.16.4 Test description

8.16.16.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.16.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.16.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.16.4.1-1: General test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.4 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 TDD	As specified in section A.2.2
Channel Bandwidth ($BW_{channel}$)	MHz	5	Channel bandwidth for cells on primary and secondary component carriers
Note 1: See Table 8.16.4.4.1-1 for other general test parameters. Note 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C3.3.1.			

8.16.16.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of Table 8.16.4.4.3 → use Table 8.16.16.4.3.
- Instead of Table 8.16.4.5-1 → use Table 8.16.16.5-1.

8.16.16.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.16.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.16.4.1-1.
- Instead of Table 8.16.4.5-1 → use Table 8.16.16.5-1.

Table 8.16.16.5-1: Cell specific test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	5		5		5	
OCNG Patterns defined in D.2.9 (OP.9 TDD) and in D.2.10 (OP.10 TDD)		OP.9 TDD		OP.10 TDD		OP.10 TDD	
Note: See Table 8.16.4.5-1 for other cell-specific test parameters.							

8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX

8.16.17.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.16.17.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.17.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+24 provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:
  - the UE has sent a valid measurement report for the SCell being activated and
  - the SCell being activated remains detectable according to the cell identification conditions specified in TS 36.133 [4] section 8.3.3.2,
- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section TS 36.133 [4] 8.3.3.2.

Otherwise upon receiving the SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+34 provided the SCell can be successfully detected on the first attempt.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe *n*+24 or *n*+34 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [8] with the exception of CQI index = 0 (out of range) provided:

- the conditions in section 7.7 are met over the entire SCell activation delay and
- the conditions for CQI reporting defined in Section 7.2.3 of [8] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [26] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n+9* when PCell belongs to E-UTRA FDD.

Starting from the subframe specified in TS 36.213 [8] section 4.3 and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for the SCell.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe *n*, the UE shall accomplish the deactivation actions specified in [26] for the SCell being deactivated no later than in subframe *n+8*.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n*+9 when PCell belongs to E-UTRA FDD.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.17.

8.16.17.4 Test description

8.16.17.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.17.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.17.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.17.4.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 FDD (Cell 1)	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	µs	0	
Time alignment error between cell2 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	7	During this time the PCell shall be known and the SCell configured and detected.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.
Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.17.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into two variants, found in steps 6a and 6b and in steps 8a and 8b. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.17.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.17.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 6, otherwise go to step 9.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   6a. For intra-band CA UE,

   - If the first CSI report for SCell is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
   - and DTX is not observed by the SS outside the subframes (m+5) to (m+13) up to the end of T2,
   - Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 9.

   6b. For inter-band CA UE,

   - If the first CSI report is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
   - and ≤ 2 non-consecutive DTX subframes are observed by the SS during the subframes (m+5) to (m+13) up to the end of T2,
   - Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

   8a. For intra-band CA UE,

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8)
   - and DTX is not observed by the SS outside the subframes time span (n+5) to (n+13) up to the end of T3,ms from the beginning of time period T3 by the SS
   - Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

8b. For inter-band CA UE,

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+5) to (n+13) up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event “Activation” in step 6a or 6b, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.17.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.17.4.3-1: Common Exception messages for E-UTRAN FDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.17.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.17.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.17.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 7.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.17.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.17.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN FDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.17.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD known SCell activation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.17.5 Test requirement

Table 8.16.17.4.1-1 and Table 8.16.17.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known SCell in non-DRX test.

Table 8.16.17.5-1: Cell specific test parameters for E-UTRAN FDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.10 (OP.10 FDD) and in D.1.2 (OP.2 FDD)		OP.10 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
RSRP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$	dB	17			17		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/N_{oc}$	dB	17			17		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.							

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+10) if the suframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe (m+24).

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

Figures 8.16.17.5-1 and 8.16.17.5-2 show the deriviation of the Test procedure requreiment for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

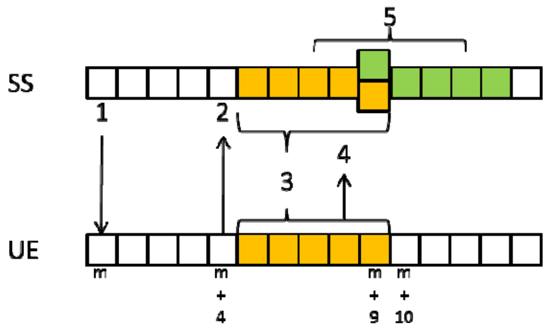

Figure 8.16.17.5-1: Procedure derivation for Activation (Intra-band case)

1) Activation command for SCell
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Possible DTX reception period on SS due to interruption by SCell1 activation

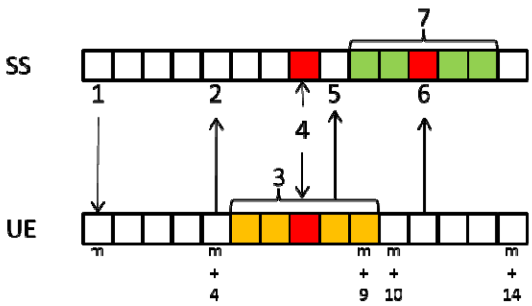

Figure 8.16.17.5-2: Procedure derivation for Activation (Inter-band case)

1) Activation command for SCell
2) ACK for MAC-CE for SCell activation
3) Possible interruption period by SCell activation
4) Allowed interruption timing(1 subframe in m+5~m+9) on UE by SCell activation,

   that is, possible DTX timing on SS
5) First CSI report timing(could be invalid CQI) at m+8 (might be m+10 due to interruption)
6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell activation
7) Possible DTX reception period on SS due to interruption by SCell1 activation

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+ 9).

The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.17AE-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The test procedure and requirement for interruption of PCell needs further investigation

8.16.17A.1 Test purpose

Same test purpose as defined in clause 8.16.17.1.

8.16.17A.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE FDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.17A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 8.16.17.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.17A.

8.16.17A.4 Test description

8.16.17A.4.1 Initial conditions

Same initial conditions as in clause 8.16.17.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell
- The listed parameter values in Table 8.16.17A.4.1-1 will replace the values of corresponding parameters in Table 8.16.17.4.1-1 other parameters keep the same.

Table 8.16.17A.4.1-1: General test parameters for known SCell activation case for 20MHz +20MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 FDD	As specified in section A.2

8.16.17A.4.2 Test procedure

Same test procedure as in clause 8.16.17.4.2.

8.16.17A.4.3 Message contents

Same as Message contents as in clause 8.16.17.4.3.

8.16.17A.5 Test requirement

Table 8.16.17A.4.1-1 and Table 8.16.17A.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known SCell in non-DRX test. The listed parameter values in Table 8.16.17A.5-1 will replace the values of corresponding parameters in Table 8.16.17.5-1 other parameters keep the same.

Table 8.16.17A.5-1: Cell specific test parameters for E-UTRAN FDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20		
OCNG Patterns defined in D.1.17 (OP.17 FDD) and in D.1.12 (OP.12 FDD)		OP.17 FDD			OP.12 FDD		

The UE shall send the first CSI report for SCell at latest 9ms into T2.

The UE shall start sending CSI reports for SCell with non-zero CQI index at latest 24ms into T2.

The UE shall stop sending CSI reports for SCell in at latest 8ms into T3.

Interruption of PCell during SCell activation shall not happen outside the time span 5 to 9ms into T2.

Interruption of PCell during SCell deactivation shall not happen outside the time span 5 to 9ms into T3.

The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX

8.16.18.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.16.18.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.18.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+24 provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:

    - the UE has sent a valid measurement report for the SCell being activated and

    - the SCell being activated remains detectable according to the cell identification conditions specified in TS 36.133 [4] section 8.3.3.2,

- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in TS 36.133 [4] section 8.3.3.2.

Otherwise upon receiving the SCell activation command in subframe *n*, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [26] for the SCell being activated no later than in subframe *n*+34 provided the SCell can be successfully detected on the first attempt.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe *n*+24 or *n*+34 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [8] with the exception of CQI index = 0 (out of range) provided:

- the conditions in TS 36.133 [4] section 7.7 are met over the entire SCell activation delay and

- the conditions for CQI reporting defined in Section 7.2.3 of [8] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [26] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

Starting from subframe n+11 when PCell belongs to E-UTRA TDD and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI in SCell.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe *n*, the UE shall accomplish the deactivation actions specified in [26] for the SCell being deactivated no later than in subframe *n+8*.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.18.

8.16.18.4 Test description

8.16.18.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in 3GPP TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.18.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.18.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.16.18.4.1-1: General test parameters for known SCell activation case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
Channel Bandwidth ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211 [9]. The same configuration applies to all cells.
Uplink-downlink configuration		1	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on secondary component carrier.
SCell measurement cycle (measCycleSCell)	ms	320	
Cell2 timing offset to cell1	µs	0	
Time alignment error between cell2 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1	µs	3	Synchronous cells
T1	s	7	During this time the PCell shall be known and the SCell configured, detected and reported.
T2	s	1	During this time the UE shall activate the SCell.
T3	s	1	During this time the UE shall deactivate the SCell.
Note: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.			

8.16.18.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are two carriers, each with one cell. Both cells have constant signal levels throughout the test. Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) but is not aware of Cell 2 on radio channel 2. The UE is only monitoring the PCC. The UE shall be continuously scheduled in the PCell throughout the whole test.

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see 3GPP TS 36.133 [4], clause 7.8) hence the test procedure has been divided into two variants, found in steps 6a and 6b and in steps 8a and 8b. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.16.18.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.18.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8). T2 starts.

6. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   6a. For intra-band CA UE:

   - If the first CSI report for SCell is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption
     - or (m+13) if the subframe (m+8) and subframe (m+9) were subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24) ,
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
   - and DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) up to the end of T2,
   - Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 9.

   6b. For inter-band CA UE

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+24),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+24)
   - and DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+5), (m+9) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+6), (m+13) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+7), (m+13) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframe (m+8) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframe (m+9) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+10), (m+14) up to the end of T2,
     - or DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (m+11), (m+18) up to the end of T2,

- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 9.

7. When T2 expires, the SS deactivate SCC by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 8, otherwise go to step 9.

8. The UE shall stop sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell deactivation. If the last CSI report is received less than or equal to 8ms from the beginning of time period T3 by the SS

   8a. For intra-band CA UE

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
   - and either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) up to the end of T3,
   - Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

8b. For inter-band CA UE

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
   - and DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+5), (n+9) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+6), (n+13) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+7), (n+13) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+8) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+9) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+10), (n+14) up to the end of T3,
     - or either DTX or "NACK/DTX" (defined in TS36.213 clause 10.1) are not observed by the SS outside the subframes (n+11), (n+18) up to the end of T3,
   - Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

9. When T3 expires, or Activation in step 5 was not acknowledged, or a fail was counted for the event "Activation" in step 6a or 6b, or Deactivation in step 7 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and

ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat steps 2-11 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.18.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.18.4.3-1: Common Exception messages for E-UTRAN TDD known SCell activation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.18.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.18.4.3-3: *CQI-ReportConfig-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.18.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 7.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.18.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.18.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	FALSE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.18.4.3-7: *MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD known SCell activation*

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2
}			

8.16.18.5 Test requirement

Table 8.16.18.4.1-1 and Table 8.16.18.5-1 define the primary level settings including test tolerances for E-UTRAN TDD activation and deactivation of known SCell in non-DRX test.

Table 8.16.18.5-1: Cell specific test parameters for E-UTRAN TDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
RSRP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$	dB	17			17		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/N_{oc}$	dB	17			17		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.							

The UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

The UE shall start sending CSI reports for SCell with non-zero CQI index at latest 24ms into T2.

The UE shall stop sending CSI reports for SCell in at latest 8ms into T3.

Interruption of PCell during SCell activation shall not happen outside the time span 5 to 11ms into T2.

Interruption of PCell during SCell deactivation shall not happen outside the time span 5 to 11ms into T3.

[The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.]

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.18A E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth

8.16.18A.1 Test purpose

Same test purpose as defined in clause 8.16.18.1.

8.16.18A.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 25.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.18A.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 8.16.18.3 with the following exception:

- The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.18A.

8.16.18A.4 Test description

8.16.18A.4.1 Initial conditions

Same initial conditions as in clause 8.16.18.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz for both PCell and SCell
- The listed parameter values in Table 8.16.18A.4.1-1 will replace the values of corresponding parameters in Table 8.16.18.4.1-1 other parameters keep the same.

Table 8.16.18A.4.1-1: General test parameters for known SCell activation case for 20MHz +20MHz

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2

8.16.18A.4.2 Test procedure

Same test procedure as in clause 8.16.18.4.2.

8.16.18A.4.3 Message contents

Same message contents as in clause 8.16.18.4.3.

8.16.18A.5 Test requirement

Table 8.16.18A.4.1-1 and Table 8.16.18A.5-1 define the primary level settings including test tolerances for E-UTRAN TDD activation and deactivation of known SCell in non-DRX test. The listed parameter values in Table 8.16.18A.5-1 will replace the values of corresponding parameters in Table 8.16.18.5-1 other parameters keep the same.

Table 8.16.18A.5-1: Cell specific test parameters for E-UTRAN TDD known SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
$BW_{channel}$	MHz	20			20		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8 TDD)		OP.7 TDD			OP.8.TDD		

The UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+9) if the subframe (m+8) was subject to interruption, or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated. Whether CSI report in subframe (m+8) and/or (m+9) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8) and/or (m+9).

The UE shall start sending CSI reports for SCell with non-zero CQI index at latest 24ms into T2.

The UE shall stop sending CSI reports for SCell in at latest 8ms into T3.

Interruption of PCell during SCell activation shall not happen outside the time span 5 to 11ms into T2.

Interruption of PCell during SCell deactivation shall not happen outside the time span 5 to 11ms into T3.

[The interruption of PCell shall not be more than 5 subframes for intra-band CA and for 1 subframe for inter-band CA specified in TS 36.133 [4] Section 7.8.2.]

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.19

8.16.20

8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth

8.16.21.1 Test purpose

Same test purpose as in clause 8.16.2.1.

8.16.21.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.21.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.2.3.

8.16.21.4 Test description

8.16.21.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 8.16.21.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.21.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.21.4.3.

5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier, and Cell 3 is the neighbouring cell of Cell 2 on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.21.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20MHz+10MHz bandwidth

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbor cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-96	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell2 timing offset to cell1		µs	0	
Time alignment error between cell2 and cell1		µs	≤ Time alignment error as specified in TS 36.104 [30] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
Cell3 timing offset to cell1		µs	3	Synchronous cells
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.				

8.16.21.4.2 Test procedure

Same test procedure as in clause 8.16.2.4.2 with the following exceptions:

- Instead of Table 8.16.2.4.3 → use Table 8.16.21.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.21.5-1.

8.16.21.4.3 Message contents

Same message contents as in clause 8.16.2.4.3 with the following exceptions:

Table 8.16.21.4.3-6: *ReportConfig-A2-H*: Additional E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20MHz+10MHz bandwidth

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	44	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.16.21.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.21.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.21.5-1.

Table 8.16.21.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for 20MHz+10MHz bandwidth

Parameter	Unit	Combination	Cell 1			Cell 2			Cell 3		
			T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		All	1			2			2		
$BW_{channel}$		20MHz+10MHz	20MHz: $N_{RB,c}$ = 100			10MHz: $N_{RB,c}$ = 50			10MHz: $N_{RB,c}$ = 50		
		10MHz+20MHz	10MHz: $N_{RB,c}$ = 50			20MHz: $N_{RB,c}$ = 100			20MHz: $N_{RB,c}$ = 100		
Correlation Matrix and Antenna Configuration		All	1x2 Low			1x2 Low			1x2 Low		
PDSCH Reference measurement channel defined in A.1.2 (TDD)		20MHz+10MHz	R.3 TDD			N/A			N/A		
		10MHz+20MHz	R.0 TDD			N/A			N/A		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2 (TDD)		20MHz+10MHz	R.10 TDD			R.6 TDD			R.6 TDD		
		10MHz+20MHz	R.6 TDD			R.10 TDD			R.10 TDD		
OCNG Patterns defined in D.2 (TDD)		20MHz+10MHz	OP.7 TDD			OP.2 TDD			OP.2 TDD		
		10MHz+20MHz	OP.1 TDD			OP.8 TDD			OP.8 TDD		
PBCH_RA	dB	All	0			0			0		
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
N_{oc} Note 2	dBm/15 kHz	All	-104			-104.10					
RSRP Note 3	dBm/15 kHz	All	-84.80	-84.80	-107	-84.80	-84.80	-107.20	-infinity	-85.10	-107.10
$\hat{E}_s/I_{ot}$	dB	All	19.20	19.20	-3	19.30	0.25	-4.86	-infinity	-0.35	-4.73
SCH_RP Note 3	dBm/15 kHz	All	-84.80	-84.80	-107	-84.80	-84.80	-107.20	-infinity	-85.10	-107.10
$\hat{E}_s/N_{oc}$	dB	All	19.20	19.20	-3	19.30	19.30	-3.10	-infinity	19	-3
Propagation Condition		All	ETU70								
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.											

8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth

8.16.22.1 Test purpose

Same test purpose as in clause 8.16.4.1.

8.16.22.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA. Applicability requires support for FGI bit 111.

This test applies to all types of E-UTRA UE TDD release 11 and forward that support CA with Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.22.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.4.3.

8.16.22.4 Test description

8.16.22.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20MHz for cell on PCC and 10MHz for cell on SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.22.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.22.4.3.

5. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.22.4.1-1: General test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth

Parameter	Unit	Value	Comment
Channel bandwidth for cells on primary carrier ($BW_{channel}$)	MHz	20	Channel bandwidth for cells on primary component carrier
PDSCH parameters for cells on primary carriers		DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters for cells on primary carriers		DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
Channel bandwidth for cells on secondary carriers ($BW_{channel}$)	MHz	10	Channel bandwidth for cells on secondary component carrier
PCFICH/PDCCH/PHICH parameters for cells on secondary carrier		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
NOTE 1: See Table 8.16.4.4.1-1 for other general test parameters. NOTE 2: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C3.3.1.			

8.16.22.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of Table 8.16.4.4.3 → use Table 8.16.22.4.3.
- Instead of Table 8.16.4.5-1 → use Table 8.16.22.5-1.

8.16.22.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.22.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.22.4.1-1.
- Instead of Table 8.16.4.5-1 → use Table 8.16.22.5-1.

Table 8.16.22.5-1: Cell specific test parameters for E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
$BW_{channel}$	MHz	20		10		10	
OCNG Patterns defined in D.2.7 (OP.7 TDD) and in D.2.2 (OP.2 TDD)		OP.7 TDD		OP.2 TDD		OP.2 TDD	
NOTE: See Table 8.16.4.5-1 for other cell-specific test parameters.							

8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD

8.16.23.1 Test purpose

To verify that in TDD-FDD CA with PCell in FDD the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2.

8.16.23.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell. Applicability requires support for FGI bit 111.

8.16.23.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

Measurements of cells on the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.1.2.2 (E-UTRAN intra frequency measurements and E-UTRAN intra frequency measurements with autonomous gaps).

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1, 8.3.2 and A.8.16.23.

8.16.23.4 Test description

8.16.23.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.23.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.23.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.23.4.3.

5. Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and deactivated SCell on the TDD secondary component carrier, and Cell 3 is the neighbour cell on the TDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.23.4.1-1: General test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbor cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211[9]. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211[9]. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.

8.16.23.4.2 Test procedure

Same test procedure as in clause 8.16.1.4.2 with the following exceptions:

- Instead of clause 8.16.1.4.3 → use clause 8.16.23.4.3.
- Instead of Table 8.16.1.5-1 → use Table 8.16.23.5-1.

8.16.23.4.3 Message contents

Same message contents as in clause 8.16.1.4.3 with the following exceptions:

Table 8.16.23.4.3-1: *ReportConfig-A2-H*: Additional E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-93)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.16.23.5 Test requirement

Same test requirement as in clause 8.16.1.5 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 → use Table 8.16.23.4.1-1.
- Instead of Table 8.16.1.5-1 → use Table 8.16.23.5-1.

Table 8.16.23.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in FDD

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns defined		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104.5					
$\hat{E}_s/N_{oc}$	dB	17.20	17.20	-3	17.70	17.70	-3.70	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$	dB	17.20	17.20	-3	17.70	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2		
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD

8.16.24.1 Test purpose

To verify that in TDD-FDD CA with PCell in TDD the UE's ability to make correct reportings of Event A2 and A6 under deactivated SCell in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in clause 8.3.2.

8.16.24.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell. Applicability requires support for FGI bit 111.

8.16.24.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.23.3.

8.16.24.4 Test description

8.16.24.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.24.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.24.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.24.4.3.

5. Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and deactivated SCell on the FDD secondary component carrier, and Cell 3 is the neighbour cell on the FDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.24.4.1-1: General test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211[9].
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211[9].
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤12	UE shall report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE shall report Event A2 within 200 ms and 1.6s for cells 1 and 2, respectively.

8.16.24.4.2 Test procedure

Same test procedure as in clause 8.16.2.4.2 with the following exceptions:

- Instead of clause 8.16.2.4.3 → use clause 8.16.24.4.3.
- Instead of Table 8.16.2.5-1 → use Table 8.16.24.5-1.

8.16.24.4.3 Message contents

Same message contents as in clause 8.16.2.4.3 with the following exceptions:

Table 8.16.24.4.3-1: *ReportConfig-A2-H*: Additional E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.16.24.5 Test requirement

Same test requirement as in clause 8.16.2.5 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 → use Table 8.16.24.4.1-1.
- Instead of Table 8.16.2.5-1 → use Table 8.16.24.5-1.

Table 8.16.24.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions with PCell in TDD

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns defined		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104.5					
$\hat{E}_s/N_{oc}$	dB	17.20	17.20	-3	17.70	17.70	-3.70	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$	dB	17.20	17.20	-3	17.70	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-86.80	-86.80	-107	-86.80	-86.80	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-58.94 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2		
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			3		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD

8.16.25.1 Test purpose

To verify that in TDD-FDD CA with PCell in FDD the UE's ability to make a correct reporting of Event A6 on deactivated SCell with PCell interruption in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in TS 36.133[4] clause 8.3.2 while at the same time fulfilling the requirements on interruption rate.

8.16.25.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell. Applicability requires support for FGI bit 111.

8.16.25.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.23.3.

8.16.25.4 Test description

8.16.25.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.25.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.25.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.25.4.3.

5. Cell 1 is the PCell on the FDD primary component carrier, Cell 2 is the configured and deactivated SCell on the TDD secondary component carrier, and Cell 3 is the neighbour cell on the TDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.25.4.1-1: General test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	1280	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)

8.16.25.4.2 Test procedure

Same test procedure as in clause 8.16.3.4.2 with the following exceptions:

- Instead of clause 8.16.3.4.3 → use clause 8.16.25.4.3.
- Instead of Table 8.16.3.5-1 → use Table 8.16.25.5-1.

8.16.25.4.3 Message contents

Same message contents as in clause 8.16.3.4.3.

8.16.25.5 Test requirement

Same test requirement as in clause 8.16.3.5 with the following exceptions:

- Instead of Table 8.16.3.4.1-1 → use Table 8.16.25.4.1-1.
- Instead of Table 8.16.3.5-1 → use Table 8.16.25.5-1.

Table 8.16.25.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in FDD

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		-		-	
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patterns defined		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-101		-101			
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-infinity	16
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-infinity	-0.11
RSRP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
SCH_RP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
Io Note 3	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		0		3	
Time alignment error relative to cell 1 Note 5	µs	-		≤ TAE		N/A	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD

8.16.26.1 Test purpose

To verify that in TDD-FDD CA with PCell in TDD the UE's ability to make a correct reporting of Event A6 on deactivated SCell with PCell interruption in non-DRX within the requirements for SCell stated in TS 36.133[4] section 8.3.3.2.1 and the requirements for PCell stated in TS 36.133[4] clause 8.3.2 while at the same time fulfilling the requirements on interruption rate.

8.16.26.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell. Applicability requires support for FGI bit 111.

8.16.26.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.23.3.

8.16.26.4 Test description

8.16.26.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 8.16.26.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.26.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.26.4.3.

5. Cell 1 is the PCell on the TDD primary component carrier, Cell 2 is the configured and deactivated SCell on the FDD secondary component carrier, and Cell 3 is the neighbour cell on the FDD secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.26.4.1-1: General test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	1280	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤30	UE shall report Event A6 within 25.6s (20×scellMeasCycle)

8.16.26.4.2 Test procedure

Same test procedure as in clause 8.16.4.4.2 with the following exceptions:

- Instead of clause 8.16.4.4.3 → use clause 8.16.26.4.3.
- Instead of Table 8.16.4.5-1 → use Table 8.16.26.5-1.

8.16.26.4.3 Message contents

Same message contents as in clause 8.16.4.4.3.

8.16.26.5 Test requirement

Same test requirement as in clause 8.16.4.5 with the following exceptions:

- Instead of Table 8.16.4.4.1-1 → use Table 8.16.26.4.1-1.
- Instead of Table 8.16.4.5-1 → use Table 8.16.26.5-1.

Table 8.16.26.5-1: Cell specific test parameters for E-UTRAN TDD-FDD CA Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX with PCell in TDD

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-		-	
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	
OCNG Patterns defined		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-101		-101			
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	-infinity	16
$\hat{E}_s/I_{ot}$	dB	16	16	16	-0.11	-infinity	-0.11
RSRP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
SCH_RP Note 3	dBm/15 kHz	-85	-85	-85	-85	-infinity	-85
Io Note 3	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 2	
Propagation Condition		AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		0		3	
Time alignment error relative to cell 1 Note 5	µs	-		≤ TAE		N/A	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

8.16.27 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD

8.16.27.1 Test purpose

To verify the UE's ability to make correct reportings of Events A1, A2 and A6 under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.27.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 3DL CA with FDD as PCell.

8.16.27.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] sub-clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated SCell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.27.

8.16.27.4 Test description

8.16.27.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.27.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.27.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.27.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is a SCell on RF channel number 2, Cell 3 is a SCell on RF channel number 3, and Cell 4 is a neighbour cell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.27.4.1-1: General test parameters for E-UTRAN TDD-FDD 3 DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration applies to all TDD cells (cell2, cell3 and cell4).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration applies to all TDD cells (cell2, cell3 and cell4).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time cell 1 and cell 3 shall be known to the UE; but cell 2 and cell 4 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell 2 and event A6 for cell 4
T3		s	5	UE should report Event A2 for cells 1, 2 and 3.

8.16.27.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 4. At the beginning of T2 the transmission power of cell 4 is increased to the same level as cell 3, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2 and for Cell 3.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCells (cell 2 and cell 3) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.27.4.3.

4. Set the parameters according to T1 in Table 8.16.27.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.27.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.

9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.27.5-1.

11. The UE shall transmit MeasurementReport messages triggered by Event A2 for cell 1, cell 2 and cell 3, respectively.

12. If the measurement reporting delay for cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

13. If the measurement reporting delay for cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

14. If the measurement reporting delay for cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.

15. After the SS receives the MeasurementReport message in steps 12, 13 and 14 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

16. Set cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

17. Set cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of cell 4 = physical cell identity of cell 3 then skip this physical cell identity value for cell 4.

18. After the RRC connection release, the SS:
    - transmits in cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

19. Repeat step 3-18 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2” and “Cell 3 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table

G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.27.4.3-1: Common Exception messages for E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7Table H.4.1-6

Table 8.16.27.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)and neighbouring cell on the SCC (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	5 entries		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		
measId	3		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		

}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.27.4.3-3: MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.27.4.3-4: *ReportConfig-A1*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.27.4.3-5: *ReportConfig-A2*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.27.4.3-6: *MeasurementReport*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table 8.16.27.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.27.4.3-8: *MeasurementReport*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table 8.16.27.4.3-9: *MeasurementReport*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	4		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

Table 8.16.27.4.3-10: *MeasurementReport*: Additional E-UTRAN TDD-FDD 3DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	5		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

8.16.27.5 Test requirement

Table 8.16.27.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD test.

Table 8.16.27.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD

ameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4	
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2
RF Channel		1			2			3				
		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				
arameters: ence nent		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			-			-			-	
PDCCH/PHI neters: ence nent		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 10MHz: R.6 20MHz: R.10	
atterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 10MHz: OP.2 20MHz: OP.8	
A	dB	0			0			0			0	
B	dB											
	dB											
	dB											
RB	dB											
RA	dB											
RB	dB											
RA	dB											
RB	dB											
RA	dB											
RB	dB											
A Note 1	dB											
B Note 1	dB											
	dBm/15 KHz	-104			-104			-104.5				
	dB	17	17	-3	-infinity	17.2	-3.2	17.7	17.7	-3.7	-infinity	17
	dB	17	17	-3	-infinity	17.2	-3.2	17.7	0.61	-5.24	-infinity	-0.77
3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5
Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5
	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in colu Cell 3	
ion Condition		AWGN			ETU70			ETU70			ETU70	
n Matrix and Configuration		1x2			1x2 Low			1x2 Low			1x2 Low	
fset to Cell 1	µs	-			0			0			3	
nment error cell 1 Note 5	µs	-			≤ TAE			≤ TAE			N/A	
ment error cell 2 Note 5	µs	-			-			≤ TAE			N/A	

OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM syn
Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be moc
AWGN of appropriate power for N_{oc} to be fulfilled.
Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themsel
The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to 2×TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for cell 2 and cell 3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = $T_{measure\_scc}$
- where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for cell 2 and one Event A2 triggered measurement report for cell 3 with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, and Cell 3 Event A2.

Decide the test pass, if events A1 **and** A6 **and all** the A2 events are passed, otherwise fail the UE.

8.16.28 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD

8.16.28.1 Test purpose

To verify the UE's ability to make correct reportings of Events A1, A2 and A6 under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.28.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 12 and forward that support E-UTRA FDD and TDD and 3DL CA with TDD as PCell.

8.16.28.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.27.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.28.

8.16.28.4 Test description

8.16.28.4.1 Initial conditions

Same initial conditions as in clause 8.16.27.4.1 with the following exceptions:

- The general test parameter settings are set up according to Table 8.16.28.4.1-1.
- Message contents are defined in clause 8.16.28.4.3.

Table 8.16.28.4.1-1: General test parameters for E-UTRAN TDD-FDD 3 DL CA event triggered reporting under Deactivated SCells in Non-DRX with PCell in TDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration applies to TDD cell (cell1).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration applies to TDD cell (cell1).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of events A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for events A2. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time cell 1 and cell 3 shall be known to the UE; but cell 2 and cell 4 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell 2 and event A6 for cell 4
T3		s	5	UE should report Event A2 for cells 1, 2 and 3.

8.16.28.4.2 Test procedure

Same test procedure as in clause 8.16.27.4.2 with the following exceptions:

- Instead of Table 8.16.27.5-1 → use Table 8.16.28.5-1.
- Message content exceptions are defined in clause 8.16.28.4.3.

8.16.28.4.3 Message contents

Same message contents as in clause 8.16.27.4.3.

8.16.28.5 Test requirement

Table 8.16.28.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD test.

Table 8.16.28.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD

ameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4	
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2
RF Channel		1			2			3				
		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				
parameters: ence nent		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-			-	
PDCCH/PHI neters: ence nent		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 I 10MHz: R.6 I 20MHz: R.10	
atterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 10MHz: OP.2 20MHz: OP.12	
A	dB											
B	dB											
	dB											
	dB											
RB	dB											
RA	dB											
RB	dB	0			0			0			0	
RA	dB											
RB	dB											
RA	dB											
RB	dB											
A Note 1	dB											
B Note 1	dB											
	dBm/15 KHz	-104			-104			-104.5				
	dB	17	17	-3	-infinity	17.2	-3.2	17.7	17.7	-3.7	-infinity	17
3	dB	17	17	-3	-infinity	17.2	-3.2	17.7	0.61	-5.24	-infinity	-0.77
e 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5
Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5
	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)	Specified in colu Cell 3	
ion Condition		AWGN			ETU70			ETU70			ETU70	
on Matrix and Configuration		1x2			1x2 Low			1x2 Low			1x2 Low	
fset to Cell 1	µs	-			0			0			3	
nment error cell 1 Note 5	µs	-			≤ TAE			≤ TAE			N/A	
nment error cell 2 Note 5	µs	-			-			≤ TAE			N/A	

OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM syn
Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be moc
AWGN of appropriate power for N_{oc} to be fulfilled.
Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themsel
The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Same Event reporting requirements for A1, A6 and A2 as in clause 8.16.27.5.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, and Cell 3 Event A2.

Decide the test pass, if events A1 **and** A6 **and all** the A2 events are passed, otherwise fail the UE.

8.16.29 3 DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX

8.16.29.1 Test purpose

To verify that the UE correctly detects Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [5] within the requirements stated in TS 36.133[4] clause 8.3.3.2.1.

8.16.29.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL with Intra-band contiguous CA, or 3DL with Inter-band CA, or 3DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 3DL with Intra-band non-contiguous and Inter-band CA, or 3DL with Intra-band non-contiguous and Intra-band contiguous.

8.16.29.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell.*

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133[4] Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133[4] the sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133[4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.29.

8.16.29.4 Test description

8.16.29.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.29.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.29.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.29.4.3.
5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2 and Cell 4 is the neighbouring cell on SCC2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.29.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2 (SCell 1)	Configured deactivated secondary cell 1 on RF channel number 2.
			Cell 3 (SCell 2)	Configured deactivated secondary cell 2 on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin. No event A1 reporting is configured for cell 1 and 3.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier 1.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier 2.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell) for SCell 1 and 2		ms	320	
T1		s	5	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		s	≤12	UE should report Event A1 within 1.6s (5×scellMeasCycle) UE should report Event A6 within 6.4s (20×scellMeasCycle)
T3		s	5	UE should report Event A2 within 200 ms and 1.6s for cells 1, 2 and 3, respectively.

8.16.29.4.2 Test procedure

It is indicated to the UE in the measurement control information that event-triggered reporting with Events A1 (SCell 1), Events A2 (PCell and SCell 1/2) and A6 is used.

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively.
During T1 the UE shall not have any information on cell 4. Immediately at beginning of T2 the transmission power of cell 2 is increased above a threshold value such that this shall result in reporting of Event A1 for SCell 1, and cell 4 is increased to the same level as for Cell 3. Due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell 1/2, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure the SCCs according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCells (cell 2 and cell 3) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.29.4.3.

4. Set the parameters according to T1 in Table 8.16.29.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message configuring events A1, A2 and A6 according to Table 8.16.29.4.1-1.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.1.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A1 for Cell 2. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.
   The UE shall also transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message(s) in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.29.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1, Cell 2 and Cell 3, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.

10c. If the measurement reporting delay for Cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.

11. After the SS receives the MeasurementReport messages in steps 10a, 10b and 10c or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 4 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 4.

13. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2” and Cell3 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table

G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.29.4.3-1: Common Exception messages for E-UTRAN FDD 3DL CA Event triggered reporting under deactivated SCell in non-DRX under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.29.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)and neighbouring cell on the SCC2 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entry		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	idReportConfig-A6		
reportConfig[3]	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	5 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	idReportConfig-A1		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	idReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	idReportConfig-A2		
measId[4]	4		
measObjectId[4]	IdMeasObject-f3		
reportConfigId[4]	idReportConfig-A2		
measId[5]	5		
measObjectId[5]	IdMeasObject-f3		

reportConfigId[5]	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.29.4.3-3: MeasObjectEUTRA-GENERIC: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.29.4.3-4: *ReportConfig-A1-H*: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
A1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
Hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.29.4.3-5: *ReportConfig-A2-H*: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.29.4.3-6: MeasurementReport: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.29.4.3-7: MeasurementReport: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.29.4.3-8: MeasurementReport: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.29.4.3-9: MeasurementReport: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	4		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.29.4.3-10: MeasurementReport: Additional E-UTRAN FDD 3 DL CA Event triggered Reporting under Deactivated SCell in non-DRX under fading propagation conditions requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	5		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

8.16.29.5 Test requirement

Table 8.16.29.5-1 defines the primary level settings including test tolerances for 3 DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX.

Table 8.16.29.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0			0			0		
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB												
PHICH_RA	dB												
PHICH_RB	dB												
PDCCH_RA	dB												
PDCCH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA Note 1	dB												
OCNG_RB Note 1	dB												
N_{oc} Note 2		-104			-104			-104.5					
$\hat{E}_s/N_{oc}$	dB	17	17	-3	-infinity	17.2	-3.2	17.7	17.7	-3.7	-infinity	17	-3.7
$\hat{E}_s/I_{ot}$ Note 3	dB	17	17	-3	-infinity	17.2	-3.2	17.7	0.61	-5.24	-infinity	-0.77	-5.24
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2	-infinity	-87.5	-108.2
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$/50)	-59.13 +10log ($N_{RB,c}$/50)	-74.45 +10log ($N_{RB,c}$/50)	-76.22 +10log ($N_{RB,c}$/50)	-58.94 +10log ($N_{RB,c}$/50)	-74.52 +10log ($N_{RB,c}$/50)	-58.94 +10log ($N_{RB,c}$/50)	-56.30 +10log ($N_{RB,c}$/50)	-74.03 +10log ($N_{RB,c}$/50)	Specified in columns for Cell 3		

Propagation Condition		AWGN	ETU70	ETU70	ETU70
Correlation Matrix and Antenna Configuration		1x2	1x2 Low	1x2 Low	1x2 Low
Timing offset to Cell 1	µs	-	0	0	3
Time alignment error relative to cell 1 Note 5	µs	-	≤ TAE	≤ TAE	N/A
Time alignment error relative to cell 2 Note 5	µs	-	-	≤ TAE	N/A
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.					

The overall delays measured test requirement for Events A1, A2 and A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc}$

TTI insertion uncertainty = 2×TTI_{DCCH} = 2ms

In the test measCycleSCell for SCell1 and SCell2 = 320ms

This gives, for the different Events:

The UE shall send one Event A6 triggered measurement report for cell 4 with a measurement reporting delay of less than 6402s (($T_{identify\_scc}$ = 20×measCycleSCell) + TTI insertion uncertainty) from the beginning of time T2.

The UE shall send one Event A1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 6402s (($T_{identify\_scc}$ = 20×measCycleSCell) + TTI insertion uncertainty) from beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602s (($T_{identify\_scc}$ = 5× measCycleSCell) + TTI insertion uncertainty) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 3 with a measurement reporting delay of less than 1602s (($T_{identify\_scc}$ = 5× measCycleSCell) + TTI insertion uncertainty) from beginning of time T3.

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1 giving for Cell 1:

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/fail decisions are done separately for Event A1, Event A2 and Event A6.

Decide the test pass, if events A1 **and** A2 **and** A6 are passed, otherwise fail the UE.

8.16.30 3 DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX

8.16.30.1 Test purpose

Same test purpose as in clause 8.16.29.1.

8.16.30.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL with Intra-band contiguous CA, or 3DL with Inter-band CA, or 3DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 3DL with Intra-band non-contiguous and Inter-band CA, or 3DL with Intra-band non-contiguous and Intra-band contiguous

8.16.30.3 Minimum conformance requirements

Same minimum requirements as in clause 8.16.29.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.30.

8.16.30.4 Test description

8.16.30.4.1 Initial conditions

Same initial conditions as 8.16.29.4.1 with the following exceptions:

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.30.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

8.16.30.4.2 Test procedure

Same test procedure as 8.16.29.4.2 with the following exceptions:

- Instead of Table 8.16.29.5-1 → use Table 8.16.30.5-1.
- Instead of referring to clause 8.16.29.4.3 → refer to clause 8.16.30.4.3.

8.16.30.4.3 Message contents

Same message content as in 8.16.29.4.3.

8.16.30.5 Test requirement

Same test requirements as in clause 8.16.29.5 with the exception of table 8.16.30.5.-1.

Table 8.16.30.5-1 defines the primary level settings including test tolerances for 3 DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX.

Table 8.16.30.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: N 10MHz: 20MHz: N		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2		-104			-104			-1		
$\hat{E}_s/N_{oc}$	dB	17	17	-3	-infinity	17.2	-3.2	17.7	17.7	-3.7
$\hat{E}_s/I_{ot}$ Note 3	dB	17	17	-3	-infinity	17.2	-3.2	17.7	0.61	-5.24
RSRP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2
SCH_RP Note 3	dBm/15 kHz	-87	-87	-107	-infinity	-86.8	-107.2	-86.8	-86.8	-108.2
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-74.52 +10log ($N_{RB,c}$ /50)	-58.94 +10log ($N_{RB,c}$ /50)	-56.30 +10log ($N_{RB,c}$ /50)	-74.03 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achiev
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and ti AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrie

8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD

8.16.31.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 on deactivated SCell with PCell and SCell interruptions in non-DRX and with PCell in FDD within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.31.2 Test applicability

This test case applies to all types of UE release 12 and forward supporting E-UTRA FDD and TDD and 3DL CA with FDD as PCell.

8.16.31.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.31.

8.16.31.4 Test description

8.16.31.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.31.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.65 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.31.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.31.4.3.
5. There are three E-UTRA carriers and four cells: Cell1, Cell2, Cell3 and Cell4. Cell 1 is PCell on the FDD primary component (RF Channel 1), Cell 2 is the SCell on the TDD Secondary Component (RF Channel 2), and Cell 3 is SCell on the TDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the TDD secondary component (RF Channel 3). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.31.4.1-1: General test parameters for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211[9]. The same configuration in TDD cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211[9]. The same configuration in TDD cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133[4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.31.4.2 Test procedure

The test consists of FDD Cell 1 the PCell on the FDD primary component (RF Channel 1), Cell 2 the SCell on the TDD Secondary Component Carrier (RF Channel 2), and Cell 3 SCell on the TDD secondary component (RF Channel 3) and Cell 4 the neighbour cell on the TDD secondary component (RF Channel 3). In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell Cell 2 and SCell Cell 3 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.31.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.31.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.31.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).

10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.31.5-1.

11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell2, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.

12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 4 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 4.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.31.4.3-1: Common Exception messages for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.31.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)and neighbouring cell on the SCC2 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.31.4.3-3: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4
}			

Table 8.16.31.4.3-4: MeasurementReport: E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD test requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.31.4.3-5: *SystemInformationBlockType2*: Additional E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.31.4.3-6: *SystemInformationBlockType3*: Additional E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3. Cell 4
}			

8.16.31.5 Test requirement

Table 8.16.31.4.1-1 and Table 8.16.31.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD test.

Table 8.16.31.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				3			
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD				N/A	N/A	N/A	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A				N/A			
PCFICH/PDCCH/ PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in D.1 and D.2		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD				5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			
PBCH_RA	dB																
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB	0				0				0				0			
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																

OCNG_RA Note 1	dB																
OCNG_RB Note 1	dB																
N_{oc} Note 3	dBm/15 kHz	-101				-101				-101							
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{E}_s/I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				3			
Time alignment error relative to cell 1 Note 5	µs	-				≤ TAE				≤ TAE				N/A			
Time alignment error relative to cell 2 Note 5	µs	-				-				≤ TAE				N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty

  Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms

- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case in T2 (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202mss from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case in T4 (note: this gives a total of 3.2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD

8.16.32.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 on deactivated SCell with PCell and SCell interruptions in non-DRX and with PCell in FDD within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.32.2 Test applicability

This test case applies to all types of UE release 12 and forward supporting E-UTRA FDD and TDD and 3DL CA with TDD as PCell.

8.16.32.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.32.

8.16.32.4 Test description

8.16.32.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.32.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.65 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.32.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.32.4.3.

5. There are three E-UTRA carriers and four cells: Cell1, Cell2, Cell3 and Cell4. Cell 1 is PCell on the TDD primary component (RF Channel 1), Cell 2 is the SCell on the FDD Secondary Component (RF Channel 2), and Cell 3 is SCell on the FDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the FDD secondary component (RF Channel 3). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.32.4.1-1: General test parameters for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured SCell			Cell 2	Configured secondary cell on RF channel number 2.
Configured SCell			Cell 3	Configured secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
Special subframe configuration on PCell			6	As specified in table 4.2.1 in TS 36.211[9]. The same configuration applies to all cells.
Uplink-downlink configuration on PCell			1	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133[4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.32.4.2 Test procedure

The test consists of TDD Cell 1 the PCell on the TDD primary component (RF Channel 1), Cell 2 the SCell on the FDD Secondary Component Carrier (RF Channel 2), and Cell 3 SCell on the FDD secondary component (RF Channel 3) and Cell 4 the neighbour cell on the FDD secondary component (RF Channel 3). In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell Cell 2 and SCell Cell 3 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.32.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.32.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.32.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).

10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.32.5-1.

11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and Cell 2, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell, then the number of failure tests for event “T4 A6” is increased by one.

12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 4 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 4.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.32.4.3-1: Common Exception messages for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.32.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)and neighbouring cell on the SCC2 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.32.4.3-3: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4
}			

Table 8.16.32.4.3-4: MeasurementReport: E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD test requirements

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.32.4.3-5: *SystemInformationBlockType2*: Additional E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 2
}			

Table 8.16.32.4.3-6: *SystemInformationBlockType3*: Additional E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3. Cell 4
}			

Table 8.16.32.4.3-7: *RadioResourceConfigCommonSCell-r10*: Additional E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path:TS 36.508 [7] clause 7.3.2 Table 7.3.2-2 RadioResourceConfigCommonSCell-r10-DEFAULT exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
mbsfn-SubframeConfigList-r10	Not present		Cell2
}			
}			

8.16.32.5 Test requirement

Table 8.16.32.4.1-1 and Table 8.16.32.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD test.

Table 8.16.32.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				3			
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD				N/A	N/A	N/A	5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			
OCNG Pattern defined in D.1 and D.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD				5MHz: OP.19 FDD; 10MHz :OP.6 FDD; 20MHz : OP.14 FDD	5MHz: OP.19 FDD; 10MHz :OP.6 FDD; 20MHz : OP.14 FDD	5MHz: OP.19 FDD; 10MHz :OP.6 FDD; 20MHz : OP.14 FDD	5MHz: OP.20 FDD; 10MHz :OP.10 FDD; 20MHz : OP.17 FDD	5MHz: OP.16FDD; 10MHz:OP.2 FDD; 20MHz: OP.12FDD				5MHz: OP.16FDD; 10MHz:OP.2 FDD; 20MHz: OP.12FDD			
PBCH_RA	dB																
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB	0				0				0				0			
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA[Note 1]	dB																
OCNG_RB[Note 1]	dB																

N_{oc} Note 3	dBm/15 kHz	-101				-101				-101							
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{E}_s/I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				3			
Time alignment error relative to cell 1 Note5	µs	-				≤ TAE				≤ TAE				N/A			
Time alignment error relative to cell 2 Note5	µs	-				-				≤ TAE				N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case in T2 (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202ms from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case in T4 (note: this gives a total of 3,2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.33 E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX

8.16.33.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 on deactivated SCell with PCell and SCell interruptions in non-DRX within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.33.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL Intra-band contiguous CA or 3DL Inter-band CA, or 3DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 3DL with Intra-band non-contiguous and Inter-band CA, or 3DL with Intra-band non-contiguous and Intra-band contiguous CA.

8.16.33.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.33.

8.16.33.4 Test description

8.16.33.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.33.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.65 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.33.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.33.4.3.
5. There are three E-UTRA FDD carriers and four cells: Cell1, Cell2, Cell3 and Cell4. Cell 1 is PCell on the FDD primary component (RF Channel 1), Cell 2 is the SCell on the FDD Secondary Component (RF Channel 2), and Cell 3 is SCell on the FDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the FDD secondary component (RF Channel 3). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.33.4.1-1: General test parameters for E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133[4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 63.2s (5×scellMeasCycle)

8.16.33.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (RF Channel 2), and Cell 3 SCell on the FDD secondary component (RF Channel 3) and Cell 4 the neighbour cell on the FDD secondary component (RF Channel 3). In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure the SCell Cell 2 and SCell Cell 3 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.
4. Set the parameters according to T1 in Table 8.16.33.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.
6. The UE shall transmit RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.33.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.
9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.33.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).
10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.33.5-1.
11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.
12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. Set Cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 4 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 4.
14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.33.4.3-1: Common Exception messages for E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.33.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)and neighbouring cell on the SCC2 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.33.4.3-3: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4
}			

Table 8.16.33.4.3-4: MeasurementReport: E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

Table 8.16.33.4.3-5: *SystemInformationBlockType2*: Additional E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1, Cell 2
}			

Table 8.16.33.4.3-6: *SystemInformationBlockType3*: Additional E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3. Cell 4
}			

Table 8.16.33.4.3-7: *SystemInformationBlockType5*: Additional E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4
}			

Table 8.16.33.4.3-8: *RadioResourceConfigCommonSCell-r10*: Additional E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path:TS 36.508 [7] clause 7.3.2 Table 7.3.2-2 RadioResourceConfigCommonSCell-r10-DEFAULT exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
mbsfn-SubframeConfigList-r10	Not present		Cell2
}			
}			

8.16.33.5 Test requirement

Table 8.16.33.4.1-1 and Table 8.16.33.5-1 define the primary level settings including test tolerances for E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test.

Table 8.16.33.5-1: Cell specific test parameters for E-UTRAN FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				3			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD				N/A	N/A	N/A	5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			
OCNG Pattern defined in D.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD				5MHz: OP.19 FDD 10MHz: OP.6 FDD 20MHz: OP.14 FDD	5MHz: OP.19 FDD 10MHz: OP.6 FDD 20MHz: OP.14 FDD	5MHz: OP.19 FDD 10MHz: OP.6 FDD 20MHz: OP.14 FDD	5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			
PBCH_RA	dB	0				0				0				0			
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA[Note 1]	dB																
OCNG_RB[Note 1]	dB																

N_{oc} Note 3	dBm/15 kHz	-101				-101				-101							
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{E}_s/I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				3			
Time alignment error relative to cell 1 Note 5	µs	-				≤ TAE				≤ TAE				N/A			
Time alignment error relative to cell 2 Note 5	µs	-				-				≤ TAE				N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 from the start of time period T2 and on cell2 from the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202ms from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case (note: this gives a total of 3.2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX

8.16.34.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 on deactivated SCell with PCell and SCell interruptions in non-DRX within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.34.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and forward that support 3DL Intra-band contiguous CA or 3DL Inter-band CA, or 3DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 3DL with Intra-band non-contiguous and Inter-band CA, or 3DL with Intra-band non-contiguous and Intra-band contiguous CA.

8.16.34.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.34.

8.16.34.4 Test description

8.16.34.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.34.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.65 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.34.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.34.4.3.
5. There are three E-UTRA TDD carriers and four cells: Cell1, Cell2, Cell3 and Cell4. Cell 1 is PCell on the TDD primary component (RF Channel 1), Cell 2 is the SCell on the TDD Secondary Component (RF Channel 2), and Cell 3 is SCell on the TDD secondary component (RF Channel 3) and Cell 4 is the neighbour cell on the TDD secondary component (RF Channel 3). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.34.4.1-1: General test parameters for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Neighbour cell			Cell 4	Neighbour cell to be identified on RF channel number 3.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211[9]. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211[9]. The same configuration in both cells
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133[4] clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2 and 3 but not cell 4.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.34.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (RF Channel 2), and Cell 3 SCell on the TDD secondary component (RF Channel 3) and Cell 4 the neighbour cell on the TDD secondary component (RF Channel 3). In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, both Cell2 and Cell3 are deactivated. During T1 the UE shall not have any information of cell 4. Immediately at beginning of T2 the transmission power of cell 4 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3, the transmission power of Cell 4 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell3 remains deactivated. Immediately at beginning of T4 the transmission power of Cell 4 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure the SCell Cell 2 and SCell Cell 3 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.
4. Set the parameters according to T1 in Table 8.16.34.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.
6. The UE shall transmit RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.34.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.
9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.34.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8)..
10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.34.5-1.
11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.
12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. Set Cell 4 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 4 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 4.
14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.34.4.3-1: Common Exception messages for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.34.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)and neighbouring cell on the SCC2 (Cell 4)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.34.4.3-3: MeasurementReport: E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 4	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

8.16.34.5 Test requirement

Table 8.16.34.4.1-1 and Table 8.16.34.5-1 define the primary level settings including test tolerances for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test.

Table 8.16.34.5-1: Cell specific test parameters for E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				3			
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD				N/A	N/A	N/A	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD				5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Pattern defined in D.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD				5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD				5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			
PBCH_RA	dB	0				0				0				0			
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA Note 1	dB																

OCNG_RB Note 1	dB																
N_{oc} Note 3	dBm/15 kHz	-101				-101				-101							
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	-Infinity	16	-Infinity	16
$\hat{E}_s/I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	-Infinity	-0.11	-Infinity	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-Infinity	-85	-Infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)	-57.11 +10log ($N_{RB,c}$/50)	-54.15 +10log ($N_{RB,c}$/50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				3			
Time alignment error relative to cell 1 Note 5	µs	-				≤ TAE				≤ TAE				N/A			
Time alignment error relative to cell 2 Note 5	µs	-				-				≤ TAE				N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 prior to the start of time period T2 and on cell2 prior to the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case in T2 (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202ms from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 4.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case in T4 (note: this gives a total of 3.2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.35 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX

8.16.35.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for UE configured with two downlink SCells, when the SCells are known by the UE at the time of activation and PCell is in FDD.

8.16.35.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 3DL CA with FDD as PCell. Applicability requires support for FGI bit 25.

8.16.35.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in section 7.7.2;

K_i ($0 \le K_i \le [3]$) is the number of times the other ith SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \le N \le 3$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.35.

8.16.35.4 Test description

8.16.35.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.35.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.35.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.35.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, and Cell 3 is the deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.35.4.1-1: General test parameters for 3 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell and SCell2 shall be known and the SCell1 configured, detected and reported
T2	s	1	During this time the UE shall activate the SCell1.
T3	s	1	During this time the UE shall deactivate the SCell1.

8.16.35.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.35.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.35.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.35.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+10).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell activation.

    - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

        - or (m+10) if the subframe (m+8) was subject to interruption,

    - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),

        - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)

    - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,

    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,

    - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3,

    - and ≤2 inconsecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3

    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.35.4.3-1: Common Exception messages for 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.35.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.35.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional 3 DL PCell in FDD activation and deactivation of known SCell in non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.35.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.35.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path:TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.35.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.35.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.35.4.3-8: *SystemInformationBlockType2:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

8.16.35.5 Test requirement

Table 8.16.35.5-1 defines the primary level settings including test tolerances for 3 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX test.

Table 8.16.35.5-1: Cell specific test parameters for 3 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

Figure 8.16.35.5-1 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

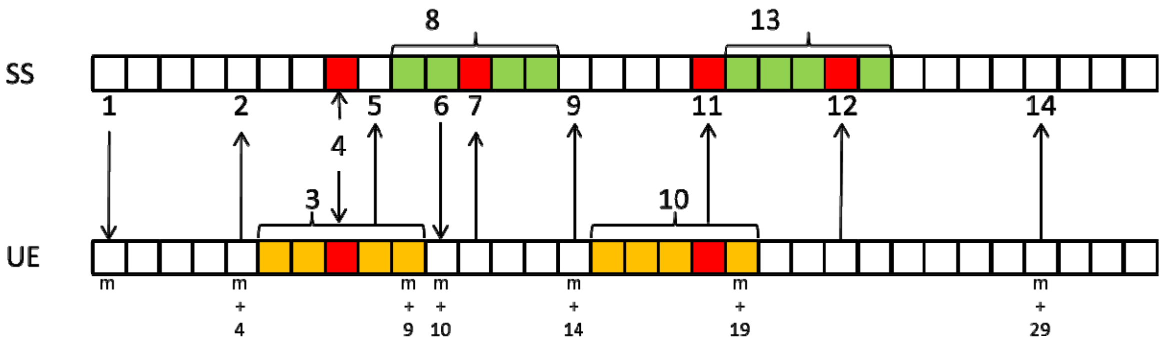

Figure: 8.16.35.5-1 Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS
5) First CSI report timing (could be an invalid CQI) at m+8 (might be m+10 due to interruption)
6) Activation command for SCell2
7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation
8) Possible DTX reception period on SS due to interruption by SCell1 activation
9) ACK for MAC-CE for SCell2 activation
10) Possible interruption period by SCell2 activation
11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS
12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.36 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX

8.16.36.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for UE configured with two downlink SCells, when the SCells are known by the UE at the time of activation and PCell is in TDD.

8.16.36.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 3DL CA with TDD as PCell. Applicability requires support for FGI bit 25.

8.16.36.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in section 7.7.2;

K_i ($0 \le K_i \le [3]$) is the number of times the other ith SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \le N \le 3$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.36.

8.16.36.4 Test description

8.16.36.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.36.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.36.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.36.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, and Cell 3 is the deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.36.4.1-1: General test parameters for 3 DL PCell in TDD CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The same configuration applies to all cells.
Uplink-downlink configuration		1	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell and SCell2 shall be known and the SCell1 configured, detected and reported
T2	s	1	During this time the UE shall activate the SCell1.
T3	s	1	During this time the UE shall deactivate the SCell1.

8.16.36.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause Tables 8.16.36.4.3-1 to 8.16.36.4.3-6.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.36.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.36.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+15).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell activation.

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

     - or (m+9) if the subframe (m+8) was subject to interruption,

     - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated.

   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),

     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)

   - and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,

     - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,

     - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,

     - or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,

     - Or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,

     - or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,

     - or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,

   - then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 11, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+15).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), up to the end of T3,

     - or DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), up to the end of T3,

     - or DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), up to the end of T3,

     - or DTX is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,

     - or DTX is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,

     - or DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), up to the end of T3,

     - or DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33), up to the end of T3,

- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event "Activation" in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:

    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),

    or

    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.36.4.3-1: Common Exception messages for 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.36.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.38.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.36.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.36.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.36.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.36.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

8.16.36.5 Test requirement

Table 8.16.36.5-1 defines the primary level settings including test tolerances for 3 DL PCell in TDD CA activation and deactivation of known SCell in non-DRX test.

Table 8.16.36.5-1: Cell specific test parameters for 3 DL PCell in TDD CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

Figure 8.16.36.5-1 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

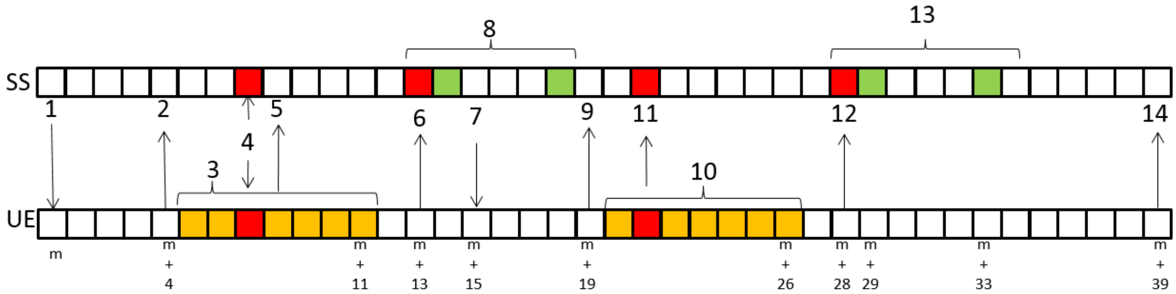

Figure 8.16.36.5-1: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1(T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) Allowed interruption timing (1 subframe in m+5~m+11) on UE by SCell1 activation, that is, possible DTX timing on SS
5) First CSI report timing(invalid CQI) at m+8 (might be m+9 or m+13 due to interruption)
6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation
7) Activation command for SCell2
8) Possible DTX reception period on SS due to interruption by SCell1 activation (only m+13, m+14 or m+18 are allowed)
9) ACK for MAC-CE for SCell2 activation
10) Possible interruption period by SCell2 activation
11) Allowed interruption timing(1 subframe in m+20~m+26) on UE by SCell2 activation, that is, possible DTX timing on SS
12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation (only m+28, m+29 or m+33 are allowed)
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing(valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

NOTE: If there are no uplink resources for reporting the valid CSI 29ms into T2 then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.37 3DL FDD CA activation and deactivation of known SCell in non-DRX

8.16.37.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for 3DL FDD carrier aggregation, when the SCells are known by the UE at the time of activation.

8.16.37.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support 3DL with intra-band contiguous CA or 3DL with inter-band CA, or 3DL with intra-band contiguous and inter-band CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 3DL with intra-band non-contiguous and inter-band CA, or 3DLwith intra-band non-contiguous and intra-band contiguous CA. Applicability requires support for FGI bit 25.8.16.37.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \leq K \leq [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.37.

8.16.37.4 Test description

8.16.37.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated CA bandwidth combination supported by UE from Table 8.16.37.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.37.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.37.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the deconfigured SCell1 on RF channel number 2, and Cell 3 is the deactivated SCell2 on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.37.4-1: General test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.
Configured deactivated SCell		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell and SCell2 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1 and SCell2.
T3	s	1	During this time the UE shall deactivate the SCell1 and SCell2.

8.16.37.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into three variants, found in steps 8a, 8b and 8c and in steps 11a, 11b and 11c. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.37.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.37.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.37.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+10).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells activation.

   8a. For all intra-band case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    11a. For all intra-band case

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11b. For the case where the band relation between PCC and SCells are inter-band

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3,
    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band,

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3,
    - and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+15) to (n+23) up to the end of T3,
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8a, 8b or 8c, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is

achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.37.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.37.4.3-1: Common Exception messages for E-UTRAN FDD 3DL CA activation and deactivation of known SCell in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.37.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD 3DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.37.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.37.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN FDD 3DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 7.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.37.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN FDD 3DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.37.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN FDD 3DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.37.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.37.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.37.4.3-9: *QuantityConfig-DEFAULT:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.37.4.3-10: *SystemInformationBlockType2:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.37.4.3-11: *SystemInformationBlockType3:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.37.4.3-12: *SystemInformationBlockType5:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.37.5 Test requirement

Table 8.16.37.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD 3DL CA activation and deactivation of known SCell in non-DRX test.

Table 8.16.37.5-1: Cell specific test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1	2	3
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD	-	-
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0	0	0
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-104	-104	-104
$\hat{E}_s/N_{oc}$	dB	17	17	17
$\hat{E}_s/I_{ot}$ Note 3	dB	17	17	17
RSRP Note 3	dBm/15 kHz	-87	-87	-87
SCH_RP Note 3	dBm/15 kHz	-87	-87	-87
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)	-59.13+10log ($N_{RB,c}$ /50)	-59.13+10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN	AWGN
Antenna Configuration		1x2	1x2	1x2
Timing offset to Cell 1	μs	-	0	0
Time alignment error relative to cell 1 Note 5	μs	-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 5	μs	-	-	≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

Figures 8.16.37.5-1 to 8.16.37.5-3 show the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

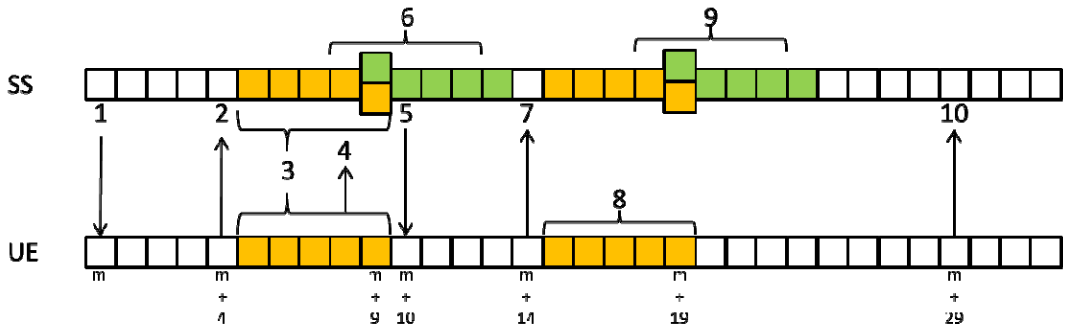

Figure 8.16.37.5-1: Procedure derivation for Activation (All intra-band case)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) First CSI report timing (could be invalid CQI)

5) Activation command for SCell2

6) Possible DTX reception period on SS due to interruption by SCell1 activation

7) ACK for MAC-CE for SCell2 activation

8) Possible interruption period by SCell2 activation

9) Possible DTX reception period on SS due to interruption by SCell2 activation

10 Latest valid CSI report timing (valid CQI)

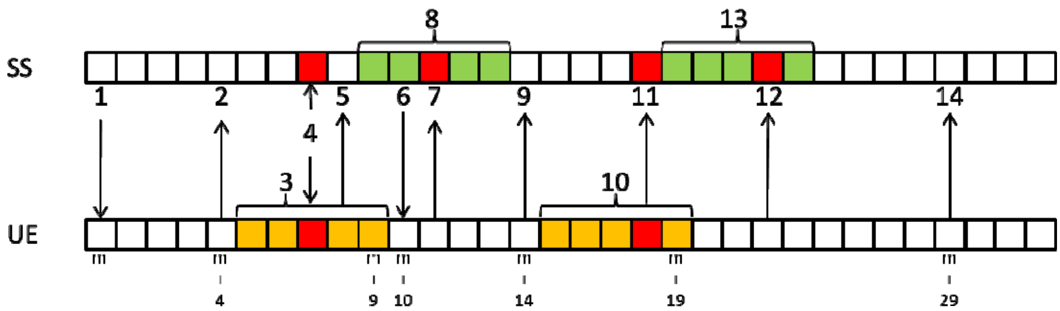

Figure: 8.16.37.5-2 Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS

5) First CSI report timing (could be invalid CQI) at m+8 (might be m+10 due to interruption)

6) Activation command for SCell2

7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation

8) Possible DTX reception period on SS due to interruption by SCell1 activation

9) ACK for MAC-CE for SCell2 activation

10) Possible interruption period by SCell2 activation

11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS

12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

13) Possible DTX reception period on SS due to interruption by SCell2 activation

14) Latest valid CSI report timing (valid CQI)

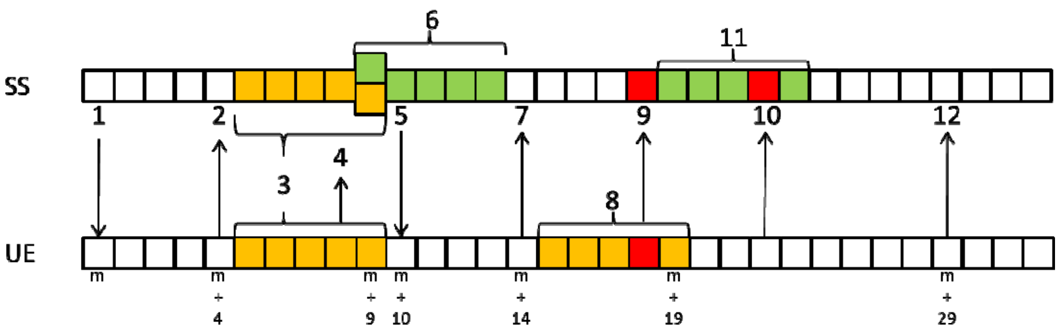

Figure 8.16.37.5-3: Procedure derivation for Activation (The case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) First CSI report timing (could be invalid CQI)

5) Activation command for SCell2

6) Possible DTX reception period on SS due to interruption by SCell1 activation

7) ACK for MAC-CE for SCell2 activation

8) Possible interruption period by SCell2 activation

9) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS

10) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

11) Possible DTX reception period on SS due to interruption by SCell2 activation

12) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the requirements defined in the Test Procedure shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.38 3 DL TDD CA Activation and Deactivation of known SCell in non-DRX

8.16.38.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for 3DL TDD carrier aggregation, when the SCells are known by the UE at the time of activation.

8.16.38.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support 3DL with intra-band contiguous CA or 3DL with inter-band CA, or 3DL with intra-band contiguous and inter-band CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 3DL with intra-band non-contiguous and inter-band CA, or 3DLwith intra-band non-contiguous and intra-band contiguous CA. Applicability requires support for FGI bit 25.

8.16.38.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \leq K \leq [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
    - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.38.

8.16.38.4 Test description

8.16.38.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.38.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.38.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.38.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, and Cell 3 is the deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.38.4.1-1: General test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell		Cell 2	Deconfigured secondary cell on RF channel number 2.
Configured deactivated SCell		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
Special subframe configuration		6	As specified in Table 4.2-1 in TS 36.211 [9]. The same configuration applies to all cells.
Uplink-downlink configuration		1	As specified in Table 4.2-2 in TS 36.211 [9]. The same configuration applies to all cells
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell and SCell2 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1 and SCell2.
T3	s	1	During this time the UE shall deactivate the SCell1 and SCell2

8.16.38.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into three variants, found in steps 8a, 8b and 8c and in steps 11a, 11b and 11c. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.38.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.38.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.38.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, where m is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+15).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells activation.

   8a. For all intra-band case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption,
     - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29).
   - and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption,
     - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to (m+29),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29),
   - and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,

- or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,

- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

8c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

- If the first CSI report for SCell1 is received by the SS in a subframes (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption,
  - or in a subframe (m+13) if the subframes (m+8) and (m+9) were subject to interruption when an intra-band SCell is activated,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+29),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+29),
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13),
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14),
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18),
- and DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

9. When T2 expires, the SS deactivate SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13.6.1.3.8) in a subframe (n+15).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

11a. For all intra-band case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) and the subframes (n+20) to (n+24) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) and the subframes (n+21) to (n+25) and (n+28) to (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) and the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33), up to the end of T3,

- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11b. For the case where the band relation between PCC and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13)
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14),
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
- and DTX is not observed by the SS outside the subframes (n+20) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+21) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+22) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+25) and (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+26) and (n+33), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8a, 8b or 8c, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the

UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.38.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.38.4.3-1: Common Exception messages for E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.38.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.38.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.38.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.38.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.38.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.38.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

8.16.38.5 Test requirement

Table 8.16.38.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX test.

Table 8.16.38.5-1: Cell specific test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-59.13+10log ($N_{RB,c}$ /50)			-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

Figures 8.16.38.5-1 to 8.16.38.5-3 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation

- First CSI ➔ Last CSI
- Latest valid CSI report □ Not exist (no need to check since CSI report was already stopped)

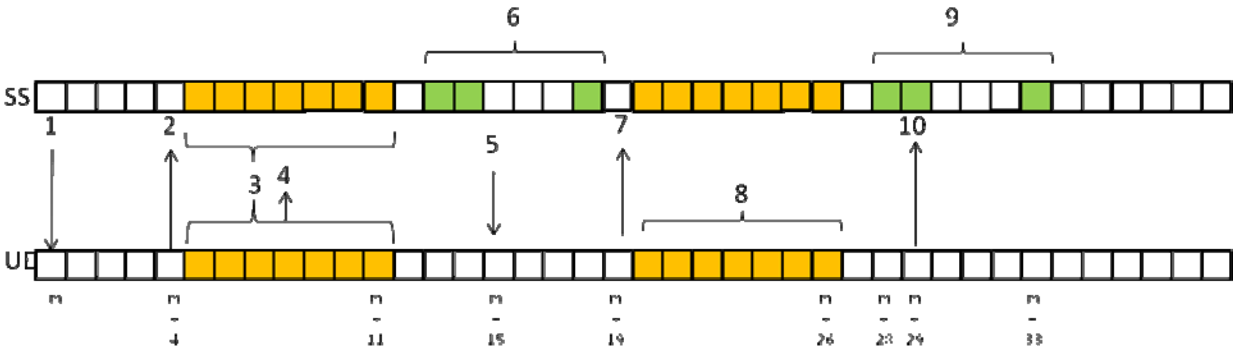

Figure 8.16.38.5-1: Procedure derivation for Activation (All intra-band case)

1) Activation command for SCell1(T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing(invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation

   (Only green subframes are allowed)
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Possible DTX reception period on SS due to interruption by SCell2 activation

   (Only green subframes are allowed)
10) Latest valid CSI report timing(valid CQI)

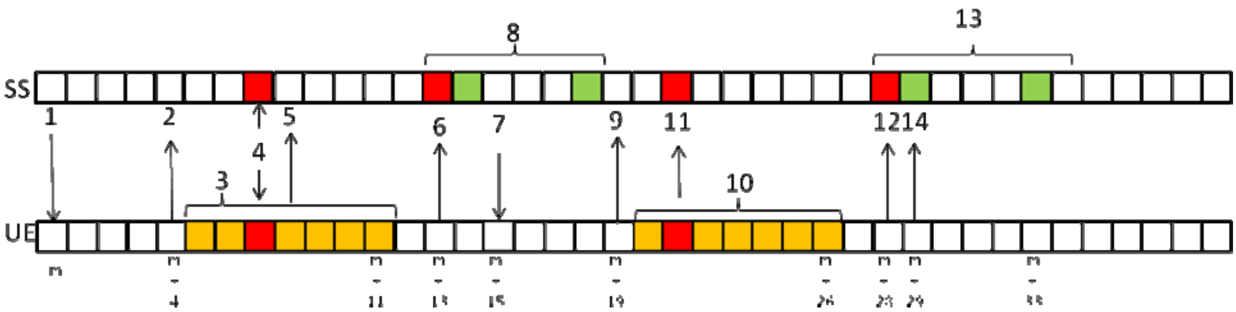

Figure 8.16.38.5-2: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1(T2 starts)
2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) Allowed interruption timing(1 subframe in m+5~m+11) on UE by SCell1 activation,

   that is, possible DTX timing on SS

5) First CSI report timing(invalid CQI) at m+8 (might be m+12 due to interruption)

6) Activation command for SCell2

7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation

8) Possible DTX reception period on SS due to interruption by SCell1 activation

   (Only m+13, m+14 or m+18 are allowed)

9) ACK for MAC-CE for SCell2 activation

10) Possible interruption period by SCell2 activation

11) Allowed interruption timing(1 subframe in m+20~m+26) on UE by SCell2 activation,

   that is, possible DTX timing on SS

12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

   (Only m+28, m+29 or m+33 are allowed)

13) Possible DTX reception period on SS due to interruption by SCell2 activation

14) Latest valid CSI report timing(valid CQI)

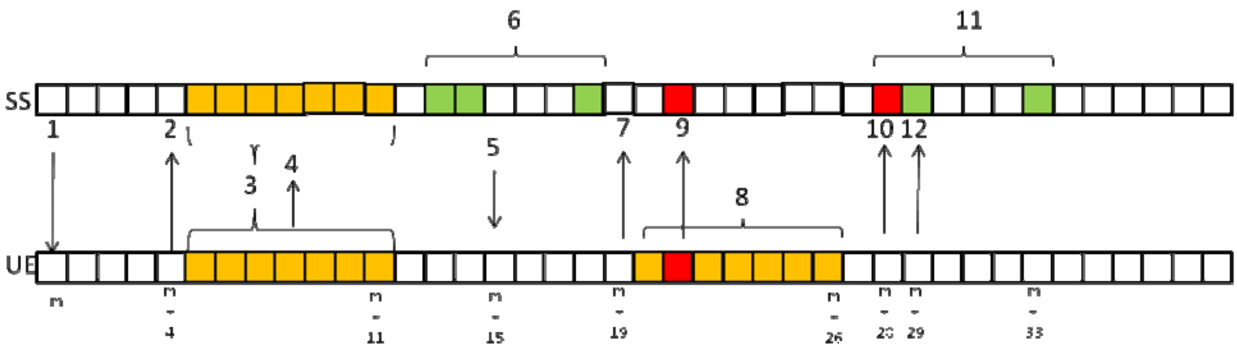

Figure 8.16.38.5-3: Procedure derivation for Activation (the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band)

1) Activation command for SCell1(T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) First CSI report timing(invalid CQI)

5) Activation command for SCell2

6) Possible DTX reception period on SS due to interruption by SCell1 activation

   (Only green subframes are allowed)

7) ACK for MAC-CE for SCell2 activation

8) Possible interruption period by SCell2 activation

9) Allowed interruption timing(1 subframe in m+20~m+26) on UE by SCell2 activation,

that is, possible DTX timing on SS

10) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

(Only m+28, m+29 or m+33 are allowed)

11) Possible DTX reception period on SS due to interruption by SCell2 activation

12) Latest valid CSI report timing(valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

8.16.39.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for UE configured with two downlink SCells, when the SCell is unknown by the UE at the time of activation.

8.16.39.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and TDD and 3DL CA with FDD as PCell. Applicability requires support for FGI bit 25.

8.16.39.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \leq K \leq [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:

  - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI for the SCell being activated.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.39.

8.16.39.4 Test description

8.16.39.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.39.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.39.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.39.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the Deconfigured deactivated SCell on RF channel number 2, and Cell 3 is Configured deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.39.4.1-1: General test parameters for unknown SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1 and SCell2.
T3	s	1	During this time the UE shall deactivate the SCell1 and SCell2.

8.16.39.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 is FDD cell, and Cell 2 and Cell 3 are TDD cells. Cell 1 and Cell 3 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.39.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.39.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.39.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+10).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells activation.

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

     - or (m+10) if the subframe (m+8) was subject to interruption,

- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
    - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
- and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) up to the end of T2,
- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

9. When T2 expires, the SS deactivate SCC1 and SCC2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.
10. The SS deactivates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).
11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.
    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3.
    - Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".
12. When T3 expires or Activation in step 6 was not acknowledged, or a fail was counted for the event "Activation" in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
14. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3,
15. Repeat steps 2-14 until a test verdict has been achieved,

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.39.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.39.4.3-1: Common Exception messages for E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.39.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.39.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.39.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.39.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.39.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.39.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.39.4.3-8: *SystemInformationBlockType2:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

8.16.39.5 Test requirement

Table 8.16.39.5-1 defines the primary level settings including [test tolerances for E-UTRAN TDD-FDD 3DL CA activation and deactivation of Unknown SCell in non-DRX with PCell in FDD test.

Table 8.16.39.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

<table>
<tr><td>E-UTRA RF Channel Number</td><td></td><td>1</td><td colspan="2">2</td><td>3</td></tr>
<tr><td>TDD special subframe configuration</td><td></td><td>-</td><td colspan="2">6</td><td>6</td></tr>
<tr><td>TDD uplink-downlink configuration</td><td></td><td>-</td><td colspan="2">1</td><td>1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td>5MHz: $N_{RB,c}$ = 25
10MHz: $N_{RB,c}$ = 50
20MHz: $N_{RB,c}$ = 100</td><td colspan="2">5MHz: $N_{RB,c}$ = 25
10MHz: $N_{RB,c}$ = 50
20MHz: $N_{RB,c}$ = 100</td><td>5MHz: $N_{RB,c}$ = 25
10MHz: $N_{RB,c}$ = 50
20MHz: $N_{RB,c}$ = 100</td></tr>
<tr><td>PDSCH parameters:
DL Reference Measurement Channel</td><td></td><td>5MHz: R.7 FDD
10MHz: R.3 FDD
20MHz: R.6 FDD</td><td colspan="2">-</td><td>-</td></tr>
<tr><td>PCFICH/PDCCH/PHICH parameters:
DL Reference Measurement Channel</td><td></td><td>5MHz: R.11 FDD
10MHz: R.6 FDD
20MHz: R.10 FDD</td><td colspan="2">5MHz: R.11 TDD
10MHz: R.6 TDD
20MHz: R.10 TDD</td><td>5MHz: R.11 TDD
10MHz: R.6 TDD
20MHz: R.10 TDD</td></tr>
<tr><td>OCNG Patterns</td><td></td><td>5MHz: OP.20 FDD
10MHz: OP.10 FDD
20MHz: OP.17 FDD</td><td colspan="2">5MHz: OP.10 TDD
10MHz: OP.2 TDD
20MHz: OP.8 TDD</td><td>5MHz: OP.10 TDD
10MHz: OP.2 TDD
20MHz: OP.8 TDD</td></tr>
<tr><td>PBCH_RA</td><td>dB</td><td rowspan="13">0</td><td colspan="2" rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td>PBCH_RB</td><td>dB</td></tr>
<tr><td>PSS_RA</td><td>dB</td></tr>
<tr><td>SSS_RA</td><td>dB</td></tr>
<tr><td>PCFICH_RB</td><td>dB</td></tr>
<tr><td>PHICH_RA</td><td>dB</td></tr>
<tr><td>PHICH_RB</td><td>dB</td></tr>
<tr><td>PDCCH_RA</td><td>dB</td></tr>
<tr><td>PDCCH_RB</td><td>dB</td></tr>
<tr><td>PDSCH_RA</td><td>dB</td></tr>
<tr><td>PDSCH_RB</td><td>dB</td></tr>
<tr><td>OCNG_RA Note 1</td><td>dB</td></tr>
<tr><td>OCNG_RB Note 1</td><td>dB</td></tr>
<tr><td>N_{oc} Note 2</td><td>dBm/15 kHz</td><td>-104</td><td colspan="2">-104</td><td>-104</td></tr>
<tr><td>$\hat{E}_s/N_{oc}$</td><td>dB</td><td>17</td><td>-infinity</td><td>17</td><td>17</td></tr>
<tr><td>$\hat{E}_s/I_{ot}$</td><td>dB</td><td>17</td><td>-infinity</td><td>17</td><td>17</td></tr>
<tr><td>RSRP Note 3</td><td>dBm/15 kHz</td><td>-87</td><td>-infinity</td><td>-87</td><td>-87</td></tr>
<tr><td>SCH_RP Note 3</td><td>dBm/15 kHz</td><td>-87</td><td>-infinity</td><td>-87</td><td>-87</td></tr>
<tr><td>Io Note 3</td><td>dBm/Ch BW</td><td>-59.13 +10log ($N_{RB,c}$ /50)</td><td>-76.22 +10log ($N_{RB,c}$ /50)</td><td>-59.13 +10log ($N_{RB,c}$ /50)</td><td>-59.13 +10log ($N_{RB,c}$ /50)</td></tr>
<tr><td>Propagation Condition</td><td></td><td>AWGN</td><td colspan="2">AWGN</td><td>AWGN</td></tr>
<tr><td>Antenna Configuration</td><td></td><td>1x2</td><td colspan="2">1x2</td><td>1x2</td></tr>
<tr><td>Timing offset to Cell 1</td><td>µs</td><td>-</td><td colspan="2">0</td><td>0</td></tr>
<tr><td>Time alignment error relative to cell 1 Note 5</td><td>µs</td><td>-</td><td colspan="2">≤ TAE</td><td>≤ TAE</td></tr>
<tr><td>Time alignment error relative to cell 2 Note 5</td><td>µs</td><td>-</td><td colspan="2">-</td><td>≤ TAE</td></tr>
<tr><td colspan="6">Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 6: TDD special subframe configuration and uplink-downlink configuration are as specified in Table 4.2-1 and 4.2-2 in TS36.211 [16]. The same configuration applies to all TDD cells.</td></tr>
</table>

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

Figure 8.16.39.5-1 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

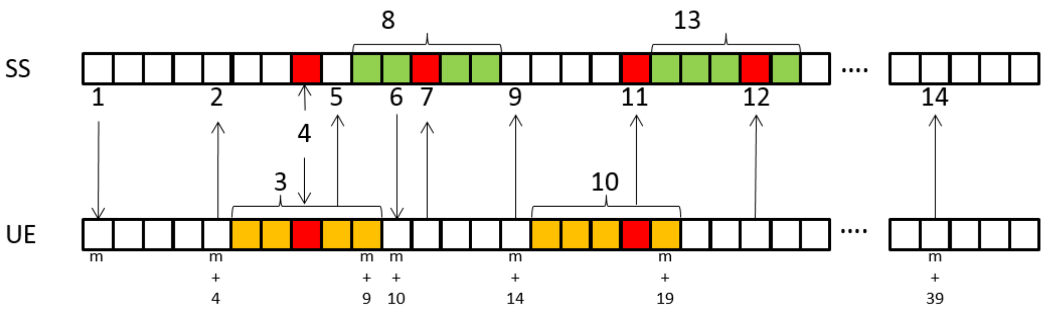

Figure 8.16.39.5-1: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS
5) First CSI report timing (could be invalid CQI) at m+8 (might be m+10 due to interruption)
6) Activation command for SCell2
7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation
8) Possible DTX reception period on SS due to interruption by SCell1 activation
9) ACK for MAC-CE for SCell2 activation
10) Possible interruption period by SCell2 activation
11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS
12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

8.16.40.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for UE configured with two downlink SCells, when the SCell is unknown by the UE at the time of activation.

8.16.40.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and TDD and 3DL CA with FDD as PCell. Applicability requires support for FGI bit 25.

8.16.40.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \leq K \leq [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI for the SCell being activated.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:

  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.40.

8.16.40.4 Test description

8.16.40.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.40.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.40.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.40.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the Deconfigured deactivated SCell on RF channel number 2, and Cell 3 is Configured deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.40.4.1-1: General test parameters for unknown SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1 and SCell2.
T3	s	1	During this time the UE shall deactivate the SCell1 and SCell2.

8.16.40.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 is FDD cell, and Cell 2 and Cell 3 are TDD cells. Cell 1 and Cell 3 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.40.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.40.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.40.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m is 4 or 9.If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+15).

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 activation.

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

- or (m+9) if the subframe (m+8) was subject to interruption,

- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),

  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)

- and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,

  - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,

  - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,

  - or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,

  - or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,

  - or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,

  - or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2.

- Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8), in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8), in subframe (n+10).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

    - and DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), up to the end of T3,

      - or DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), up to the end of T3,

      - or DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), up to the end of T3,

      - or DTX is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,

      - or DTX is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,

      - or DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), up to the end of T3,

      - or DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33), up to the end of T3,

    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3,

15. Repeat steps 2-14 until a test verdict has been achieved,

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.40.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.40.4.3-1: Common Exception messages for E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.40.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.40.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.40.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.40.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.40.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.40.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

8.16.40.5 Test requirement

Table 8.16.40.5-1 defines the primary level settings including [test tolerances for E-UTRAN TDD-FDD 3DL CA activation and deactivation of Unknown SCell in non-DRX with PCell in TDD test.

Table 8.16.40.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3

E-UTRA RF Channel Number		1	2		3
TDD special subframe configuration		6	-		-
TDD uplink-downlink configuration		1	-		-
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-		-
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA	dB	0	0		0
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-104	-104		-104
$\hat{E}_s/N_{oc}$	dB	17	-infinity	17	17
$\hat{E}_s/I_{ot}$	dB	17	-infinity	17	17
RSRP Note 3	dBm/15 kHz	-87	-infinity	-87	-87
SCH_RP Note 3	dBm/15 kHz	-87	-infinity	-87	-87
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN	AWGN		AWGN
Antenna Configuration		1x2	1x2		1x2
Timing offset to Cell 1	µs	-	0		0
Time alignment error relative to cell 1 Note 5	µs	-	≤ TAE		≤ TAE
Time alignment error relative to cell 2 Note 5	µs	-	-		≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 6: TDD special subframe configuration and uplink-downlink configuration are as specified in Table 4.2-1 and 4.2-2 in TS36.211 [16]. The same configuration applies to all TDD cells.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

Figure 8.16.40.5-1 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped).

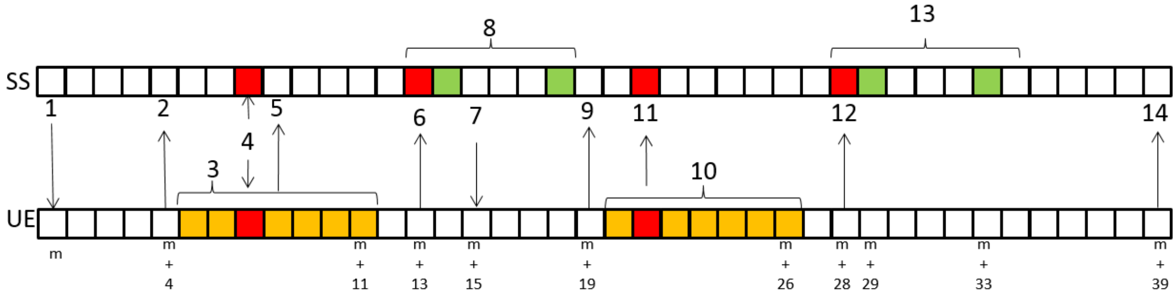

Figure 8.16.40.5-1: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1(T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) Allowed interruption timing(1 subframe in m+5~m+11) on UE by SCell1 activation, that is, possible DTX timing on SS
5) First CSI report timing(invalid CQI) at m+8 (might be m+9 or m+13 due to interruption)
6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation
7) Activation command for SCell2
8) Possible DTX reception period on SS due to interruption by SCell1 activation (only m+13, m+14 or m+18 are allowed)
9) ACK for MAC-CE for SCell2 activation
10) Possible interruption period by SCell2 activation
11) Allowed interruption timing(1 subframe in m+20~m+26) on UE by SCell2 activation, that is, possible DTX timing on SS
12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation (only m+28, m+29 or m+33 are allowed)
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing(valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.41 3 DL FDD CA activation and deactivation of unknown SCell in non-DRX

8.16.41.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] clause 7.7 for 3DL FDD carrier aggregation, when the SCell is unknown by the UE at the time of activation.

8.16.41.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 10 and forward that support 3DL intra-band contiguous CA or 3DL inter-band CA, or 3DL intra-band contiguous with inter-band CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 3DL intra-band non-contiguous and inter-band CA, or 3DL intra-band non-contiguous with intra-band contiguous CA. Applicability requires support for FGI bit 25.

8.16.41.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \le K \le [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
    - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI for the SCell being activated.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
    - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.41.

8.16.41.4 Test description

8.16.41.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.41.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.41.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.41.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, and Cell 3 is the deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.41.4.1-1: General test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell1		Cell 2	Deconfigured secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1 and SCell2.
T3	s	1	During this time the UE shall deactivate the SCell1 and SCell2.

8.16.41.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 and Cell 3 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into three variants, found in steps 8a, 8b and 8c and in steps 11a, 11b and 11c. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.41.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.41.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.41.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m, which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+10).

8. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation..

   8a. For all intra-band case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
     - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2.
   - Then the number of successes for the event "Activation" is increased by one, Otherwise, count a fail for the event "Activation" and go to step 12.

   8b. For the case where the band relation between PCC and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8)
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+5) to (m+13) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23),
   - Then the number of successes for the event "Activation" is increased by one, Otherwise, count a fail for the event "Activation" and go to step 12.

   8c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13) and the subframes (m+15) to (m+23) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23),
   - Then the number of successes for the event "Activation" is increased by one, Otherwise, count a fail for the event "Activation" and go to step 12.

9. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8), in subframe (n+10).

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    11a. For all intra-band case

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3,
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11b. For the case where the band relation between PCC and SCells are inter-band

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3,
    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+15) to (n+23)
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band,

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13) and the subframes (n+15) to (n+23) up to the end of T3,
    - and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+15) to (n+23),
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8a, 8b or 8c, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3,

15. Repeat steps 2-14 until a test verdict has been achieved,

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.41.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.41.4.3-1: Common Exception messages for E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.41.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD unknown SCell activation

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.41.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.41.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.41.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.41.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.41.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.41.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.41.4.3-9: *SystemInformationBlockType2:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.41.4.3-10: *SystemInformationBlockType3:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.41.4.3-11: *SystemInformationBlockType5:* Additional E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.41.5 Test requirement

Table 8.16.41.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX.

Table 8.16.41.5-1: Cell specific test parameters for E-UTRAN FDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/ 15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			-infinity	17		17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			-infinity	17		17		
RSRP Note 3	dBm/ 15 kHz	-87			-infinity	-87		-87		
SCH_RP Note 3	dBm/ 15 kHz	-87			-infinity	-87		-87		
Io Note 3	dBm/ Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-76.22 +10log ($N_{RB,c}$ /50)	-59.13+10log ($N_{RB,c}$ /50)		-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to Cell 2 Note 5	µs	-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: The time alignment error (TAE) between two cells specified in TS36.104 [30] clause 6.5.3.1 (value depends upon the type of carrier aggregation).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9) and outside the subframes (m+15) to (m+19).

Figures 8.16.41.5-1 to 8.16.41.5-3 show the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

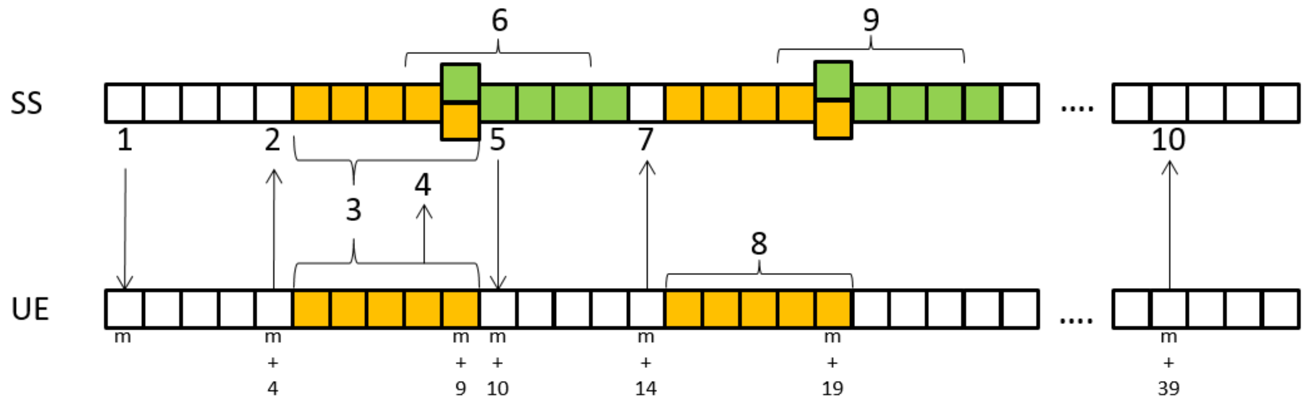

Figure 8.16.41.5-1: Procedure derivation for Activation (all intra-band case)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Possible DTX reception period on SS due to interruption by SCell2 activation
10) Latest valid CSI report timing (valid CQI)

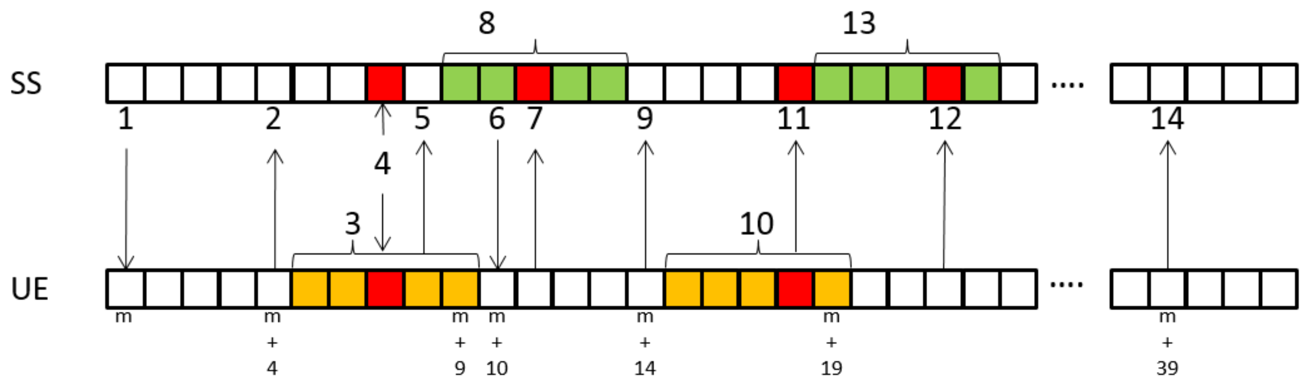

Figure 8.16.41.5-2: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation,

that is, possible DTX timing on SS

5) First CSI report timing (invalid CQI) at m+8 (might be m+10 due to interruption)

6) Activation command for SCell2

7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation

8) Possible DTX reception period on SS due to interruption by SCell1 activation

9) ACK for MAC-CE for SCell2 activation

10) Possible interruption period by SCell2 activation

11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation,

that is, possible DTX timing on SS

12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

13) Possible DTX reception period on SS due to interruption by SCell2 activation

14) Latest valid CSI report timing (valid CQI)

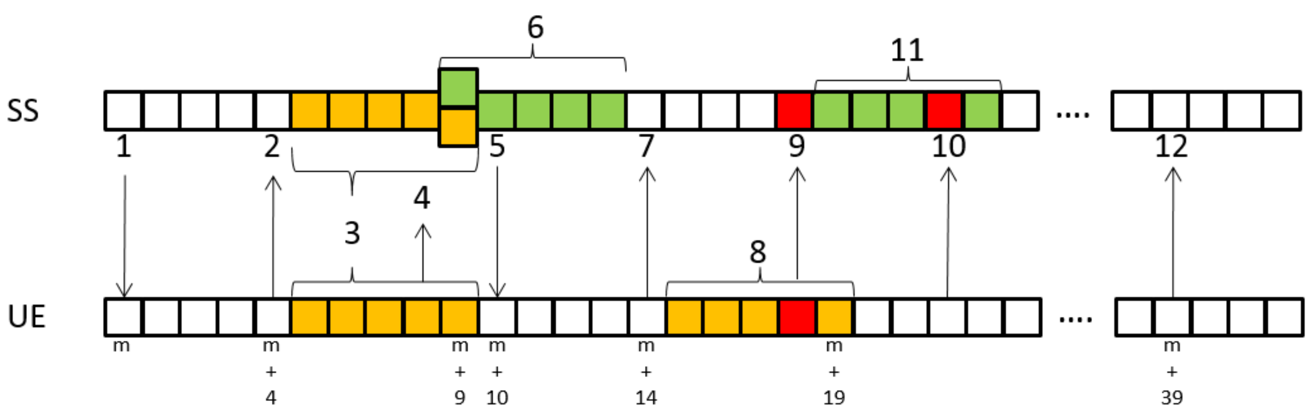

Figure 8.16.41.5-3: Procedure derivation for Activation (the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) First CSI report timing (could be invalid CQI)

5) Activation command for SCell2

6) Possible DTX reception period on SS due to interruption by SCell1 activation

7) ACK for MAC-CE for SCell2 activation

8) Possible interruption period by SCell2 activation

9) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation,

   that is, possible DTX timing on SS

10) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

11) Possible DTX reception period on SS due to interruption by SCell2 activation

12) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9) and outside the subframes (n+15) to (n+19).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the requirements defined in the Test Procedure shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.42 3 DL TDD CA activation and deactivation of unknown SCell in non-DRX

8.16.42.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements stated in TS 36.133 [4] clause 7.7 for 3DL TDD carrier aggregation, when the SCell is unknown by the UE at the time of activation.

8.16.42.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support 3DL with intra-band contiguous CA or 3DL with inter-band CA, or 3DL with intra-band contiguous and inter-band CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 3DL with intra-band non-contiguous and inter-band CA, or 3DLwith intra-band non-contiguous and intra-band contiguous CA. Applicability requires support for FGI bit 25.

8.16.42.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \le K \le [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI for the SCell being activated.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
  - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.42.

8.16.42.4 Test description

8.16.42.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.42.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.42.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.42.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, and Cell 3 is the deactivated SCell on RF channel number 3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.16.42.4.1-1: General test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3	Three radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell1		Cell 2	Deconfigured secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [16]. The same configuration applies to all cells.
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [16]. The same configuration applies to all cells
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCells every UL subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	Ms	320	
T1	Ms	100	During this time the PCell and SCell2 shall be known and the SCell1 configured,
T2	S	1	During this time the UE shall activate the SCell1 and SCell2.
T3	S	1	During this time the UE shall deactivate the SCell1 and SCell2

8.16.42.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are three carriers, each with one cell. Cell 1 and Cell 3 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC) and Cell 3 (deactivated SCell2) on radio channel 3 (SCC2), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC and SCC2. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2 the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see [3], clause 7.8) hence the test procedure has been divided into three variants, found in steps 8a, 8b and 8c and in steps 11a, 11b and 11c. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.42.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Table 8.16.42.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.42.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m where m is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+15).

8. The UE shall start sending CSI reports for SCell and the SS shall monitor CSI reports for SCell sent from the UE and ACK/NACK sent in PCell during SCell activation.

   8a. For all intra-band case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption
     - or (m+13) if the subframes (m+8) and (m+9) were subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13) and the subframes (m+20) to (m+24) and (m+28), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14) and the subframes (m+21) to (m+25) and (m+28) to (m+29), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18) and the subframes (m+22) to (m+26) and (m+28) to (m+29) and (m+33), up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

   8b. For the case where the band relation between PCC and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+9) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
   - and DTX is not observed by the SS outside the subframes (m+5), (m+9), (m+20) and (m+24), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+6), (m+13), (m+21) and (m+28), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+7), (m+13), (m+22) and (m+28), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+8) and (m+23), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+9) and (m+24), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+10), (m+14), (m+25) and (m+29), up to the end of T2,
     - or DTX is not observed by the SS outside the subframes (m+11), (m+18), (m+26) and (m+33), up to the end of T2,
   - Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

8c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+9) if the subframe (m+8) was subject to interruption
  - or (m+13) if the subframes (m+8) and (m+9) were subject to interruption
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+39),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+39)
- and DTX is not observed by the SS outside the subframes (m+5) to (m+9) and (m+13),
  - or DTX is not observed by the SS outside the subframes (m+6) to (m+10) and (m+13) to (m+14),
  - or DTX is not observed by the SS outside the subframes (m+7) to (m+11) and (m+13) to (m+14) and (m+18),
- and DTX is not observed by the SS outside the subframes (m+20) and (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+21) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+22) and (m+28), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+23), up to the end of T2,
  - or DTX is not observed by the SS outside the subframe (m+24), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+25) and (m+29), up to the end of T2,
  - or DTX is not observed by the SS outside the subframes (m+26) and (m+33), up to the end of T2,
- Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8), in a subframe # denoted n, where n is 4 or 9. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.
10. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8), in subframe (n+10).
11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell deactivation.

11a. For all intra-band case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13) and the subframes (n+20) to (n+24) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14) and the subframes (n+21) to (n+25) and (n+28) to (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18) and the subframes (n+22) to (n+26) and (n+28) to (n+29) and (n+33), up to the end of T3,
- Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

11b. For the case where the band relation between PCC and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

- and DTX is not observed by the SS outside the subframes (n+5), (n+9), (n+20) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+6), (n+13), (n+21) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+7), (n+13), (n+22) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+8) and (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+9) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+10), (n+14), (n+25) and (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+11), (n+18), (n+26) and (n+33), up to the end of T3,
- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation" and go to step 14.

11c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band,

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+9) and (n+13)
  - or DTX is not observed by the SS outside the subframes (n+6) to (n+10) and (n+13) to (n+14),
  - or DTX is not observed by the SS outside the subframes (n+7) to (n+11) and (n+13) to (n+14) and (n+18),
- and DTX is not observed by the SS outside the subframes (n+20) and (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+21) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+22) and (n+28), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+23), up to the end of T3,
  - or DTX is not observed by the SS outside the subframe (n+24), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+25) and (n+29), up to the end of T3,
  - or DTX is not observed by the SS outside the subframes (n+26) and (n+33), up to the end of T3,
- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event "Activation" in step 8a, 8b or 8c, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3,

15. Repeat steps 2-14 until a test verdict has been achieved,

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.42.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.42.4.3-1: Common Exception messages for E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.42.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.42.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	159		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.42.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.42.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.42.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.42.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

8.16.42.5 Test requirement

Table 8.16.42.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX.

Table 8.16.42.5-1: Cell specific test parameters for E-UTRAN TDD 3 DL CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			-infinite	17		17		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			-infinite	17		17		
RSRP Note 3	dBm/15 kHz	-87			-infinite	-87		-87		
SCH_RP Note 3	dBm/15 kHz	-87			-infinite	-87		-87		
Io Note 3	dBm/Ch BW	-59.13+10log ($N_{RB,c}$ /50)			-76.22 +10log ($N_{RB,c}$ /50)	-59.13+10log ($N_{RB,c}$ /50)		-59.13+10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: E_s/I_{ot}, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: The time alignment error (TAE) between two cells specified in TS 36.104 [30] clause 6.5.3.1 (value depends upon the type of carrier aggregation).

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+11) and outside the subframes (m+20) to (m+26).

Figures 8.16.42.5-1 to 8.16.42.5-3 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

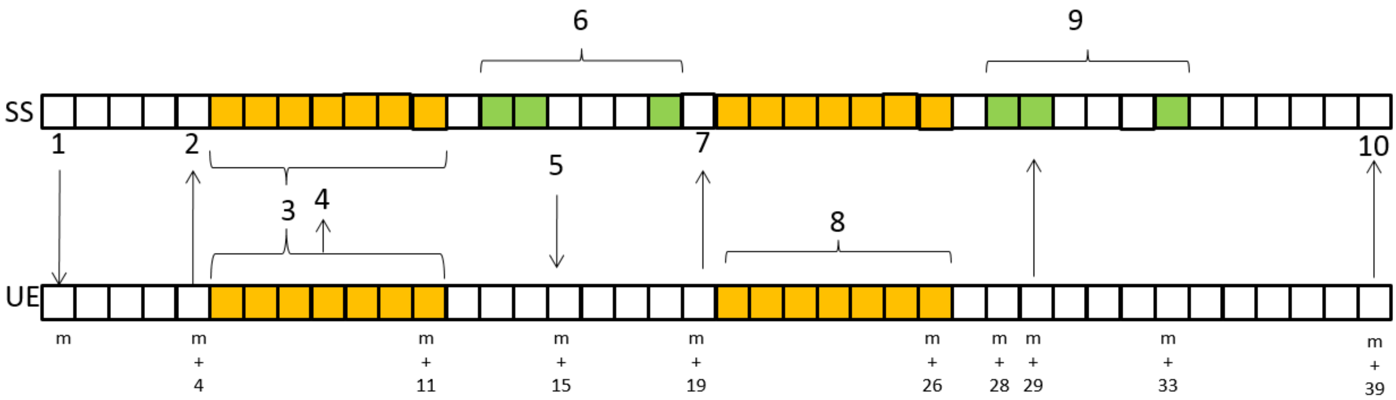

Figure 8.16.42.5-1: Procedure derivation for Activation (all intra-band case)

1) Activation command for SCell1(T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing(invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation

   (only green subframes are allowed)
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Possible DTX reception period on SS due to interruption by SCell2 activation

   (only green subframes are allowed)
10) Latest valid CSI report timing(valid CQI)

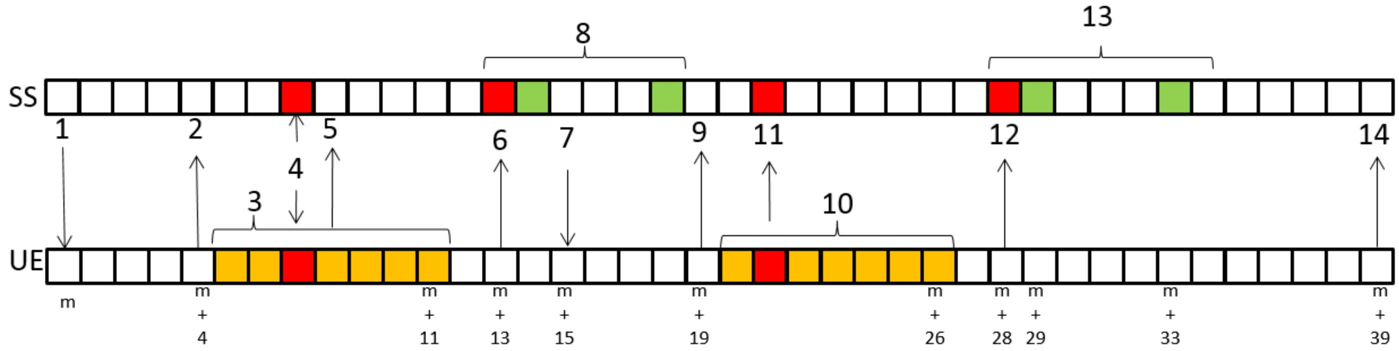

Figure 8.16.42.5-2: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1(T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) Allowed interruption timing(1 subframe in m+5~m+11) on UE by SCell1 activation,
that is, possible DTX timing on SS

5) First CSI report timing(invalid CQI) at m+8 (might be m+9 or m+13 due to interruption)

6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation

7) Activation command for SCell2

8) Possible DTX reception period on SS due to interruption by SCell1 activation
(only m+13, m+14 or m+18 are allowed)

9) ACK for MAC-CE for SCell2 activation

10) Possible interruption period by SCell2 activation

11) Allowed interruption timing(1 subframe in m+20~m+26) on UE by SCell2 activation,
that is, possible DTX timing on SS

12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
(only m+28, m+29 or m+33 are allowed)

13) Possible DTX reception period on SS due to interruption by SCell2 activation

14) Latest valid CSI report timing(valid CQI)

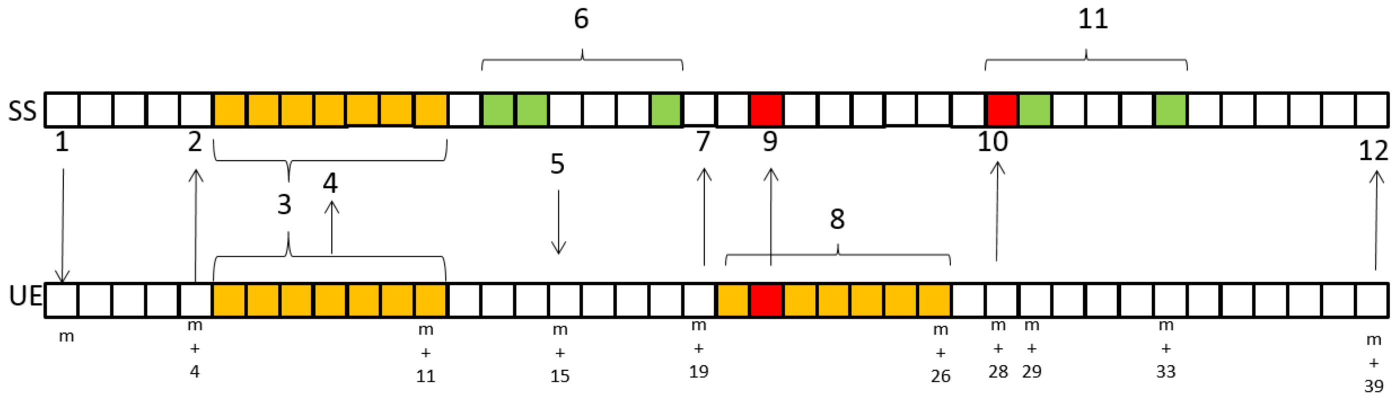

Figure 8.16.42.5-3: Procedure derivation for Activation (the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band)

1) Activation command for SCell1(T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) First CSI report timing(invalid CQI)

5) Activation command for SCell2

6) Possible DTX reception period on SS due to interruption by SCell1 activation

   (only green subframes are allowed)

7) ACK for MAC-CE for SCell2 activation

8) Possible interruption period by SCell2 activation

9) Allowed interruption timing(1 subframe in m+20~m+26) on UE by SCell2 activation,

   that is, possible DTX timing on SS

10) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

    (only m+28, m+29 or m+33 are allowed)

11) Possible DTX reception period on SS due to interruption by SCell2 activation

12) Latest valid CSI report timing(valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+11) and outside the subframes (n+20) to (n+26).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the requirements defined in the Test Procedure shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90%.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.43 to 8.16.50

8.16.51 E-UTRAN 4 DL FDD CA Event Triggered Reporting with 3 deactivated SCells in Non-DRX

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *Test tolerances and Test system uncertainties applicable to this test are undefined.*
- *Annex E table E-2 is undefined.*
- *Message content is FFS.*

8.16.51.1 Test purpose

To verify the UE's ability to make correct reportings of Events A1, A2 and A6 under deactivated SCells in non-DRX within the requirements in TS 36.133 [4] section 8.3.3.2.1.

8.16.51.2 Test applicability

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL with inter-band CA, or 4DL with intra-band contiguous and inter-band CA, or 4DL with intra-band non-contiguous and inter-band CA, or 4DL with intra-band non-contiguous and intra-band contiguous CA or 4DL with Intra-band non-contiguous and Intra-band non-contiguous CA. Applicability requires support for FGI bit 111.

8.16.51.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.16.27.3

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.51.

8.16.51.4 Test description

8.16.51.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.51.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.51.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.51.4.3.
5. Cell 1 is the PCell on the FDD PCC F1, Cell 2 is a SCell on the FDD SCC F2, Cell 3 is a SCell on the FDD SCC F3, Cell 4 is a SCell on the FDD SCC F4 and Cell 5 is a neighbour cell on the FDD SCC F4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

Table 8.16.51.4.1-1: General test parameters for E-UTRAN FDD-FDD 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4	Three radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Neighbour cell			Cell 5	Neighbour cell to be identified on RF channel number 4.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the cell1, cell3, cell4 shall be known to the UE; but cell2 and cell 5 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell2 and event A6 for cell5 within 6.4s (20×scellMeasCycle)
T3		s	5	UE should report Event A2 within 200 ms for cell1, and 1.6s for cells 2, 3 and 4.

8.16.51.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 5. At the beginning of T2 the transmission power of cell 5 is increased to the same level as for cell 4, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as for cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3, 4 and 5 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2, for Cell3 and for Cell 4.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCells (cell 2, cell 3 and cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.51.4.3.

4. Set the parameters according to T1 in Table 8.16.51.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.51.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event "A6". Otherwise count a fail for the event "A6".

9. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event "A1". Otherwise count a fail for the event "A1".

10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.51.5-1.

11. The UE shall transmit MeasurementReport messages triggered by Event A2 for cell 1, cell 2, cell 3 and cell 4, respectively.

12. If the measurement reporting delay for cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event "Cell 1 A2". If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 1 A2" is increased by one.

13. If the measurement reporting delay for cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event "Cell 2 A2". If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 2 A2 is increased by one.

14. If the measurement reporting delay for cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event "Cell 3 A2". If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 3 A2 is increased by one.

15. If the measurement reporting delay for cell 4 from the beginning of time period T3 is less than 1602ms, then count a success for the event "Cell 4 A2". If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 4 A2 is increased by one.

16. After the SS receives the MeasurementReport message in steps 12, 13, 14 and 15 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

17. Set cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

18. Set cell 5 physical cell identity = ((current cell 4 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of cell 5 = physical cell identity of cell 4 then skip this physical cell identity value for cell 5.

19. After the RRC connection release, the SS:
- transmits in cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

20. Repeat step 3-19 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2”, “Cell 3 A2” and “Cell 4 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.51.4.3 Message contents

[FFS]

8.16.51.5 Test requirement

Table 8.16.51.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-FDD 4 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX test.

Table 8.16.51.5-1: Cell specific test parameters for E-UTRAN FDD-FDD 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4			Cell 5		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3			4					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			-			-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB															
PBCH_RB	dB															
PSS_RA	dB															
SSS_RA	dB															
PCFICH_RB	dB															
PHICH_RA	dB															
PHICH_RB	dB	0			0			0			0			0		
PDCCH_RA	dB															
PDCCH_RB	dB															
PDSCH_RA	dB															
PDSCH_RB	dB															
OCNG_RA Note 1	dB															
OCNG_RB Note 1	dB															
N_{oc} Note 2	dBm/15 KHz	-104			-104			-104			-104					
$\hat{E}_s/N_{oc}$	dB	17+TT	17+TT	-3+TT	17+TT	-3+TT	-3+TT	17+TT	17+TT	-3+TT	17+TT	17+TT	-3+TT	-infinity	17+TT	-3+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	17+TT	17+TT	-3+TT	-infinity	17+TT	-3+TT	17+TT	17+TT	-3+TT	17+TT	-0.09+TT	-4.76+TT	-infinity	-0.09+TT	-4.76+TT
RSRP Note 3	dBm/15 kHz	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107	-87+TT	-87+TT	-107+TT	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT
SCH_RP Note 3	dBm/15 kHz	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT	-87+TT	-87+TT	-107+TT	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT

Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-76.22 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-74.45 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)	-56.17 +10log ($N_{RB,c}$ /50)	-73.20 +10log ($N_{RB,c}$ /50)	Specified in columns for Cell 4
Propagation Condition		AWGN			ETU70			ETU70			ETU70			ETU70
Correlation Matrix and Antenna Configuration		1x2			1x2 Low			1x2 Low			1x2 Low			1x2 Low
Timing offset to Cell 1	µs	-			0			0			0			3
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE			≤ TAE			N/A
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE			≤ TAE			N/A
Time alignment error relative to cell 3 Note 5	µs	-			-			-			≤ TAE			N/A

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$

The overall delay measured test requirement for Event A1 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A1 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delay measured test requirement for Event A6 is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty

Where:

- measurement reporting delay = $T_{identify\_scc}$
- $T_{identify\_scc}$ = 20 *measCycleSCell*
- *measCycleSCell* = 320 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6402 ms from the beginning of time T2 (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133 [4] section 8.1.2.2.1

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell*.

The overall delays measured test requirement for Event A2 for cell 2, cell 3 and cell 4 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

- measurement reporting delay = $T_{measure\_scc}$
- where $T_{measure\_scc}$ = 5 *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for cell 2, one Event A2 triggered measurement report for cell 3, and one Event A2 triggered measurement report for cell with a measurement reporting delay of less than 1602ms from beginning of time T3 (note: this gives a total of 1600 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, Cell 3 Event A2 and Cell 4 Event A2.

Decide the test pass, if events A1 and A6 and all the A2 events are passed, otherwise fail the UE.

8.16.52

8.16.53 4DL PCell in FDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- The test frequency is FFS

- The test applicability needs to be added to TS36.521-2

8.16.53.1 Test purpose

To verify that the UE correctly detects Events A1 (Serving cell becomes better than threshold), A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [5] within the requirements stated in TS 36.133[4] clause 8.3.3.2.1.

8.16.53.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 4DL CA with FDD as PCell.

8.16.53.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] sub-clause 9.1 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 [4] sub-clause 9.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in TS 36.133 [4] sub-clause 9.1.17.2.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band

The measurement period for deactivated SCell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] sub-clause 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133 [4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.53.

8.16.53.4 Test description

8.16.53.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: FFS

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.53.5-1 and 8.16.53.5-2 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.64a as appropriate.
2. The general test parameter settings are set up according to Table 8.16.53.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.53.4.3.
5. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, Cell 4 is SCell on SCC3 and Cell5 is the neighbouring cell on SCC3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 , Cell 4 and Cell5 shall be powered OFF.

Table 8.16.53.4.1-1.: General test parameters for E-UTRAN TDD-FDD 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with PCell in FDD

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4	Four radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Neighbour cell			Cell 5	Neighbour cell to be identified on RF channel number 4.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration applies to all TDD cells (cell2, cell3, cell4 and cell5).
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration applies to all TDD cells (cell2, cell3, cell4 and cell5).
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-98	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in section 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	For cell2, cell3 and cell4
T1		s	5	During this time the cell1, cell3 and cell4 shall be known to the UE; but cell2 and cell5 shall be unknown to the UE.
T2		s	≤12	UE should report Event A1 for cell2 and event A6 for cell5 within 6.4s (20×scellMeasCycle)
T3		s	5	UE should report Event A2 within 200 ms for cell1 and within 1.6s for each of cells2, 3 and 4.

8.16.53.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 5. At the beginning of T2 the transmission power of cell 5 is increased to the same level as cell 4, and due to usage of an offset this shall result in reporting of Event A6. Also, at the beginning of T2 the transmission power of cell 2 is increased to the same level as cell 1, which shall result in reporting of Event A1. At the beginning of T3 the transmission powers of cells 1, 2, 3 and 4 are reduced below a threshold value and this shall result in reporting of Event A2 for Cell 1, for Cell 2 ,for Cell 3 and for Cell4

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCells (cell 2, cell 3 and cell4) on the SCCs as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.53.4.3.
4. Set the parameters according to T1 in Table 8.16.53.5-1 and 8.16.53.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A1, A2 and A6 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.53.5-1 and 8.16.53.5-2.
8. The UE shall transmit a MeasurementReport message triggered by Event A1. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A1”. Otherwise count a fail for the event “A1”.
9. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
10. After the SS receives the MeasurementReport messages in steps 8 and 9, or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.53.5-1 and 8.16.53.5-2.
11. The UE shall transmit MeasurementReport messages triggered by Event A2 for cell 1, cell 2, cell 3 and cell4, respectively.
12. If the measurement reporting delay for cell 1 from the beginning of time period T3 is less than 202ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.
13. If the measurement reporting delay for cell 2 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2 is increased by one.
14. If the measurement reporting delay for cell 3 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 3 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 3 A2 is increased by one.
15. If the measurement reporting delay for cell 4 from the beginning of time period T3 is less than 1602ms, then count a success for the event “Cell 4 A2”. If the UE sends event-triggered measurement reports during time period T2 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 4 A2 is increased by one.
16. After the SS receives the MeasurementReport message in steps 12, 13, 14 and 15 or when T3 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
17. Set cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
18. Set cell 5 physical cell identity = ((current cell 5 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of cell 5 = physical cell identity of cell 4 then skip this physical cell identity value for cell 5.

19. After the RRC connection release, the SS:
    - transmits in cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

30. Repeat step 3-18 until a test verdict has been achieved.

Each of the events “A1”, “A6”, “Cell 1 A2”, “Cell 2 A2” , “Cell 3 A2” and “Cell 4 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.53.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.53.4.3-1: Common Exception messages for E-UTRAN FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-6

Table 8.16.53.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	4 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC (Cell 4)and neighbouring cell on the SCC (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	3 entries		
reportConfigId[1]	idReportConfig-A1		
reportConfig[1]	ReportConfigEUTRA-A1		
reportConfigId[2]	idReportConfig-A2		
reportConfig[2]	ReportConfigEUTRA-A2		
reportConfigId[3]	IdReportConfig-A6		
reportConfig[3]	ReportConfig-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	6 entries		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A1		
measId	2		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A2		

measId	3		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A2		
measId	4		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A2		
measId	5		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A2		
measId	6		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.16.53.4.3-3: MeasObjectEUTRA-GENERIC: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
offsetFreq	0 (dB 0)		
measCycleSCell-r10	sf320		Cell 2, Cell 3 Cell 4
}			

Table 8.16.53.4.3-4: *ReportConfig-A1*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.53.4.3-5: *ReportConfig-A2*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-98)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	42	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.16.53.4.3-6: *MeasurementReport*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table 8.16.53.4.3-7: *MeasurementReport*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 5	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	3 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

}			
}			

Table 8.16.53.4.3-8: *MeasurementReport*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table 8.16.53.4.3-9: *MeasurementReport*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	4		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

Table 8.16.53.4.3-10: *MeasurementReport*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	5		
measResultPCell ::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

Table 8.16.53.4.3-11: *MeasurementReport*: Additional E-UTRAN TDD-FDD 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX with PCell in FDD

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	6		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 5	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

}			
}			

8.16.53.5 Test requirement

Table 8.16.53.5-1 and 8.16.53.5-2 defines the primary level settings including test tolerances for 4DL PCell CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX.

Table 8.16.53.5-1: Cell specific test parameters for E-UTRAN TDD-FDD 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with PCell in FDD

Parameter	Unit	Cell 1			Cell 2			Cell3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 KHz	-104+TT			-104+TT			-104+TT		
$\hat{E}_s/N_{oc}$	dB	17+TT	17+TT	-3+TT	-infinity	17+TT	-3+TT	17+TT	17+TT	-3+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	17+TT	17+TT	-3+TT	-infinity	17+TT	-3+TT	17+TT	17+TT	-3+TT
RSRP Note 3	dBm/15 kHz	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT	-87+TT	-87+TT	-107+TT
SCH_RP Note 3	dBm/15 kHz	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT	-87+TT	-87+TT	-107+TT
Io Note 3	dBm/Ch BW	-59.13+TT +10log ($N_{RB,c}$/50)	-59.13+TT +10log ($N_{RB,c}$/50)	-74.45+TT +10log ($N_{RB,c}$/50)	-76.22+TT +10log ($N_{RB,c}$/50)	-59.13+TT +10log ($N_{RB,c}$/50)	-74.45+TT +10log ($N_{RB,c}$/50)	-59.13+TT +10log ($N_{RB,c}$/50)	-59.13+TT +10log ($N_{RB,c}$/50)	-74.45+TT +10log ($N_{RB,c}$/50)
Propagation Condition		AWGN			ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to cell1	µs	-			0			0		
Time alignment error relative to cell1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	≤ TAE			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	≤ TAE			≤ TAE			-		
Time alignment error relative to cell 4 Note 5	µs	≤ TAE			≤ TAE			≤ TAE		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.53.5-2: Cell specific test parameters for E-UTRAN TDD-FDD 4 DL CA event triggered reporting under fading propagation conditions with 3 configured but deactivated SCells in non-DRX with PCell in FDD

Parameter	Unit	Cell 4			Cell 5		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		4					
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100					
PDSCH parameters: DL Reference Measurement Channel		-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104+TT					
$\hat{E}_s/N_{oc}$	dB	17+TT	17+TT	-3+TT	-infinity	17+TT	-3+TT
$\hat{E}_s/I_{ot}$ Note 3	dB	17+TT	-0.09+TT	-4.76+TT	-infinity	-0.09+TT	-4.76+TT
RSRP Note 3	dBm/15 kHz	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT
SCH_RP Note 3	dBm/15 kHz	-87+TT	-87+TT	-107+TT	-infinity	-87+TT	-107+TT
Io Note 3	dBm/Ch BW	-59.13+TT +10log ($N_{RB,c}$/50)	-56.17+TT +10log ($N_{RB,c}$/50)	-73.20+TT +10log ($N_{RB,c}$/50)	Specified in columns for Cell 4		
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	0			3		
Time alignment error relative to cell1 Note5	µs	-			N/A		
Time alignment error relative to cell 2 Note 5	µs	-			N/A		
Time alignment error relative to cell 3 Note 5	µs	-			N/A		
Time alignment error relative to cell 4 Note 5	µs	-			N/A		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The overall delays measured test requirement for Events A1, A2 and A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc}$

TTI insertion uncertainty = $2 \times TTI_{DCCH}$ = 2ms

In the test measCycleSCell for SCell1 and SCell2 = 320ms

This gives, for the different Events:

The UE shall send one Event A6 triggered measurement report for cell 5 with a measurement reporting delay of less than 6402s (($T_{identify\_scc}$ = 20×measCycleSCell) + TTI insertion uncertainty) from the beginning of time T2.

The UE shall send one Event A1 triggered measurement report for Cell 2 with a measurement reporting delay of less than 6402s (($T_{identify\_scc}$ = 20×measCycleSCell) + TTI insertion uncertainty) from beginning of time T2.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 1602s (($T_{identify\_scc}$ = 5× measCycleSCell) + TTI insertion uncertainty) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 3 with a measurement reporting delay of less than 1602s (($T_{identify\_scc}$ = 5× measCycleSCell) + TTI insertion uncertainty) from beginning of time T3.

The UE shall send one Event A2 triggered measurement report for Cell 4 with a measurement reporting delay of less than 1602s (($T_{identify\_scc}$ = 5× measCycleSCell) + TTI insertion uncertainty) from beginning of time T3.

In the RRC_CONNECTED state the measurement period for intra frequency RSRP and RSRQ measurements is 200 ms as per TS 36.133[4] section 8.1.2.2.1 giving for Cell 1:

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 202 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A1, Event A6, Cell 1 Event A2, Cell 2 Event A2, Cell 3 Event A2 and Cell 4 Event A2.

Decide the test pass, if events A1 **and** A2 **and** A6 are passed, otherwise fail the UE.

8.16.54

8.16.55 E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- The test applicability needs to be added to TS36.521-2

- Annex E needs to be updated

8.16.55.1 Test purpose

To verify the UE's ability to make a correct reporting of event A6 on deactivated SCell with PCell and SCell interruptions in non-DRX as defined in TS 36.133[4] within the requirements in section 8.3.3.2.1 while at the same time fulfilling the requirements on interruption rate.

8.16.55.2 Test applicability

This test applies to all types of E-UTRA FDD Release 12 and forward UE that support 4DL CA.

8.16.55.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side condition given in Clause 9.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in TS 36.133[4] Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in TS 36.133[4] clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.16.55.

8.16.55.4 Test description

8.16.55.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.55.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.

2. The general test parameter settings are set up according to Table 8.16.55.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.16.55.4.3.

5. There are five E-UTRA FDD carriers and four cells: Cell1, Cell2, Cell3, Cell4 and Cell5. Cell 1 is PCell on the FDD primary component (RF Channel 1), Cell 2 is the SCell on the FDD Secondary Component (RF Channel 2), Cell 3 is SCell on the FDD secondary component (RF Channel 3), Cell 4 is SCell on the FDD secondary component (RF Channel 4) and Cell 5 is the neighbour cell on the FDD secondary component (RF Channel 4). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

Table 8.16.55.4.1-1: General test parameters for E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3, 4	Four radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell			Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell			Cell 4	Configured deactivated secondary cell on RF channel number 4.
Neighbour cell			Cell 5	Neighbour cell to be identified on RF channel number 4.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.11.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on secondary component carrier.
Cell-individual offset for cells on RF channel number 4		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle		ms	640	
T1		s	4	During this time the UE shall be aware of cells 1, 2, 3 and 4 but not cell 5.
T2		s	≤15	UE should report Event A6 within 12.8s (20×scellMeasCycle)
T3		s	4	During this time the UE shall activate cell 2
T4		s	≤4	UE should report Event A6 within 3.2s (5×scellMeasCycle)

8.16.55.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (RF Channel 2), Cell 3 SCell on the FDD secondary component (RF Channel 3), Cell 3 SCell on the FDD secondary component (RF Channel 4) and Cell 5 the neighbour cell on the FDD secondary component (RF Channel 4). In the measurement control information it is indicated to the UE that event-triggered reporting with Event A6 is used. The test consists of four successive time periods, with duration of T1, T2, T3 and T4, respectively. During T1 and T2, Cell2, Cell3 and Cell4 are deactivated. During T1 the UE shall not have any information of Cell 5. Immediately at beginning of T2 the transmission power of cell 5 is increased to same level as for cell 3, and due to usage of an offset this shall result in reporting of Event A6. At the beginning of T3, the transmission power of Cell 5 is turned off and the test equipment sends a MAC message for activation of Cell 2 to UE but Cell 3 and Cell4 remain deactivated. Immediately at beginning of T4 the transmission power of Cell 5 is increased to same level as for Cell 3, and due to usage of an offset this shall result in reporting of Event A6. The UE shall be continuously scheduled in the PCell throughout the whole test and continuously scheduled in Cell2 during T4.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCCs according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell Cell 2, SCell Cell 3 and SCell Cell 4 on the SCCs (RF Channel 2 and RF Channel 3) as per TS 36.508 [7] clause 5.2A.4.

4. Set the parameters according to T1 in Table 8.16.55.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

5. The SS shall transmit an RRCConnectionReconfiguration message with Event A6 configured.

6. The UE shall transmit RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.16.55.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T2 is less than 12802 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T1 until the measurement report is received during T2 for PCell then the number of successful tests for event “T2 A6” is increased by one. If the UE fails to report the event 6 within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for PCell then the number of failure tests for event “T2 A6” is increased by one.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.16.55.5-1. The SS activates SCell (Cell 2) by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8).

10. When T3 expires, the SS shall switch the power setting from T3 to T4 as specified in Table 8.16.55.5-1.

11. The UE shall transmit a MeasurementReport message triggered by Event A6. If the overall delays measured from the beginning of time period T4 is less than 3202 ms and at least 99.5% of all expected ACK/NACKS are detected by the system simulator from the start of T4 until the measurement report is received during T4 for both PCell and SCell, then the number of successful tests for event “T4 A6” is increased by one. If the UE fails to report the event within the overall delays measured requirement or less than 99.5% of all expected ACK/NACKS are detected by the system simulator for either PCell or SCell then the number of failure tests for event “T4 A6” is increased by one.

12. After the SS receives the MeasurementReport message in step 11) or when T4 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 5 physical cell identity = ((current cell 5 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 5 = physical cell identity of Cell 3 then skip this physical cell identity value for Cell 5.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat step 3-14 until a test verdict has been achieved.

Each of the events “T2 A6”and “T4 A6” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.55.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.55.4.3-1: Common Exception messages for E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-3 Table H.4.1-6

Table 8.16.55.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	4 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC1 (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[3] SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the SCell on the SCC2 (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
MeasObjectToAddMod[4] SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the SCell on the SCC3 (Cell 4)and neighbouring cell on the SCC3 (Cell 5)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f4)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f4		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		

}			

Table 8.16.55.4.3-3: *MeasObjectEUTRA-GENERIC*: Additional E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4, Cell 5
}			

Table 8.16.55.4.3-4: MeasurementReport: E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour Cell 5	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	3 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[3] {			
servFreqId-r10	3		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			

}			
}			

Table 8.16.55.4.3-5: *SystemInformationBlockType2*: Additional E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1, Cell 2
}			

Table 8.16.55.4.3-6: *SystemInformationBlockType3*: Additional E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3. Cell 4, Cell 5
}			

Table 8.16.55.4.3-7: *SystemInformationBlockType5*: Additional E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3, Cell 4, Cell 5
}			

Table 8.16.55.4.3-8: *RadioResourceConfigCommonSCell-r10*: Additional E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-2 RadioResourceConfigCommonSCell-r10-DEFAULT exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
mbsfn-SubframeConfigList-r10	Not present		Cell2
}			
}			

8.16.55.5 Test requirement

Table 8.16.55.4.1-1, Table 8.16.55.5-1 and Table 8.16.55.5-2 define the primary level settings including test tolerances for E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX test.

Table 8.16.55.5-1: Cell specific test parameters for E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX (Cell #1, Cell #2, Cell #3, Cell #4)

Parameter	Unit	Cell 1				Cell 2				Cell 3				Cell 4			
		T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
E-UTRA RF Channel Number		1				2				3				4			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100				5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD				N/A	N/A	N/A	5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD	N/A				N/A			
PCFICH/PDCCH/PHICH parameters		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD				5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			
OCNG Pattern defined in A.3.2.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD				5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD				5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			
PBCH_RA	dB	0				0				0				0			
PBCH_RB	dB																
PSS_RA	dB																
SSS_RA	dB																
PCFICH_RB	dB																
PHICH_RA	dB																
PHICH_RB	dB																
PDCCH_RA	dB																
PDCCH_RB	dB																
PDSCH_RA	dB																
PDSCH_RB	dB																
OCNG_RA[Note 1]	dB																
OCNG_RB[Note 1]	dB																

N_{oc} Note 3	dBm/15 kHz	-101				-101				-101				-101			
$\hat{E}_s/N_{oc}$	dB	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
$\hat{E}_s/I_{ot}$ Note 4	dB	16	16	16	16	16	16	16	16	16	-0.11	16	-0.11	16	-0.11	16	-0.11
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	85	-85	85	-85
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	-85	85	-85	85	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN				AWGN				AWGN				AWGN			
Antenna Configuration		1x2				1x2				1x2				1x2			
Timing offset to Cell 1	µs	-				0				0				0			
Time alignment error relative to cell 1 Note 5	µs	-				≤ TAE				≤ TAE				≤ TAE			
Time alignment error relative to cell 2 Note 5	µs	-				-				≤ TAE				≤ TAE			
Time alignment error relative to cell 3 Note 5	µs	-				-				-				≤ TAE			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE on cell1 from the start of time period T2 and on cell2 from the start of time period T4.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.55.5-2: Cell specific test parameters for E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell interruptions in Non-DRX (Cell #5)

Parameter	Unit	Cell 5			
		T1	T2	T3	T4
E-UTRA RF Channel Number		4			
$BW_{channel}$		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
PDSCH parameters: DL Reference Measurement Channel		N/A			
PCFICH/PDCCH/PHICH parameters		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			
OCNG Pattern defined in A.3.2.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			
PBCH_RA	dB	0			
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-101			
$\hat{E}_s/N_{oc}$	dB	-infinity	16	-infinity	16
$\hat{E}_s/I_{ot}$ Note 4	dB	-infinity	-0.11	-infinity	-0.11
RSRP Note 4	dBm/15 kHz	-infinity	-85	-infinity	-85
SCH_RP Note 4	dBm/15 kHz	-infinity	-85	-infinity	-85
Io Note 4	dBm/Ch BW	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)	-57.11 +10log ($N_{RB,c}$ /50)	-54.15 +10log ($N_{RB,c}$ /50)
Propagation Condition		AWGN			
Antenna Configuration		1x2			
Timing offset to Cell 1	µs	3			
Time alignment error relative to cell 1 Note 5	µs	N/A			
Time alignment error relative to cell 2 Note 5	µs	N/A			
Time alignment error relative to cell 3 Note 5	µs	N/A			

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Void
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 12802 ms from the beginning of time period T2.

The overall delays measured for Event A6 in T2 is defined as the time from the beginning of time period T2, to the moment the UE send one Event A6 triggered measurement report to Cell 5.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{identify\_scc}$ = 20 *measCycleSCell* = 12800ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12.8s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than 3202ms from the beginning of time period T4.

The overall delays measured for Event A6 in T4 is defined as the time from the beginning of time period T4, to the moment the UE send one Event A6 triggered measurement report to Cell 5.

The overall delays measured test requirement is expressed as:

- Overall delays measured = measurement reporting delay + TTI insertion uncertainty
- Measurement reporting delay = $T_{measure\_scc}$ = 5 *measCycleSCell* = 3200ms
- TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3202 ms in this test case (note: this gives a total of 3.2s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

The UE shall be scheduled on Cell2 continuously from the beginning of T4 to the end. From the start of T4 until the measurement report is received during T4, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.16.56

8.16.57 E-UTRAN FDD 4DL CA activation and deactivation of know SCell in non-DRX

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test requirements need to be updated

8.16.57.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements stated in section 7.7 for UE configured with three downlink SCells, when the SCell is known by the UE at the time of activation and PCell is in FDD.

8.16.57.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support 4DL with TDD Intra-band contiguous CA, or 4DL with Inter-band CA, or 4DL with Intra-band contiguous and Inter-band CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA UE release 11 and forward that support 4DL with Intra-band non-contiguous and Inter-band CA or 4DL with Intra-band non-contiguous and Intra-band contiguous CA, or 4DL with Intra-band non-contiguous and Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.57.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \leq K \leq [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
  - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or

   - the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.

- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.57.

8.16.57.4 Test description

8.16.57.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated CA bandwidth combination supported by UE from Table 8.16.57.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.57.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.57.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the deconfigured SCell1 on RF channel number 2, Cell 3 is the deactivated SCell2 on RF channel number 3, and Cell 4 is the deactivated SCell3 on RF channel number 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.57.4-1: General test parameters for known SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3,4	Four radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell, SCell2 and SCell3 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1.
T3	s	1	During this time the UE shall deactivate the SCell1.

8.16.57.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are four carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell1 (PCell) on radio channel 1 (PCC), Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) and Cell4 (deactivated SCell3) on radio channel 4 (SCC3), but is not aware of Cell2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC, SCC2 and SCC3. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2, the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into three variants, found in steps 8a, 8b and 8c and in steps 11a, 11b and 11c. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 and SCC3 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on the SCC2 and SCell3 (Cell 4) on the SCC3 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.57.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.57.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.57.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 and SCell3 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+10) and subframe (m+20) respectively.

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCells activation.

   8a. For all intra-band case

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2
   - Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

   8b. For the case where the band relation between PCC and SCells are inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption,
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes(m+25) to (m+33) up to the end of T2,
   - Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

   8c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
     - or (m+10) if the subframe (m+8) was subject to interruption
   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),
     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)
   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes(m+25) to (m+33) up to the end of T2,
   - and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) up to the end of T2,

- Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 12.

9. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 and SCell3 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10) and subframe (n+20) respectively.

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

11a. For all intra-band case

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

11b. For the case where the band relation between PCC and SCells are inter-band

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3
- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

11c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band,

- If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
- and DTX is not observed by the SS outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
- and ≤2 non-consecutive DTX subframes are observed by the SS the subframes (n+25) to (n+33) up to the end of T3,
- Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event "Activation" in step 8a, 8b or 8c, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

15. Repeat steps 2-14 until a test verdict has been achieved.

Each of the events "Activation" and "Deactivation" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.57.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.57.4.3-1: Common Exception messages for E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.57.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.57.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.57.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 7.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10 ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.57.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.57.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0		
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.57.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.57.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.57.4.3-9: *QuantityConfig-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.57.4.3-10: *SystemInformationBlockType2:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.57.4.3-11: *SystemInformationBlockType3:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.57.4.3-12: *SystemInformationBlockType5:* Additional E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.57.5 Test requirement

Table 8.16.57.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX test.

Table 8.16.57.5-1: Cell specific test parameters for E-UTRAN FDD 4 DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T
E-UTRA RF Channel Number		1			2			3			4		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 5 20MHz: $N_{RB,c}$ = 10		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FD 10MHz: OP.2 FD 20MHz: OP.12 FD		
PBCH_RA	dB	0			0			0			0		
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB												
PHICH_RA	dB												
PHICH_RB	dB												
PDCCH_RA	dB												
PDCCH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA Note 1	dB												
OCNG_RB Note 1	dB												
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17+TT			17+TT			17+TT			17+TT		
$\hat{E}_s/I_{ot}$	dB	17+TT			17+TT			17+TT			17+TT		
RSRP Note 3	dBm/15 kHz	-87+TT			-87+TT			-87+TT			-87+TT		
SCH_RP Note 3	dBm/15 kHz	-87+TT			-87+TT			-87+TT			-87+TT		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50) +TT			-59.13 +10log ($N_{RB,c}$ /50) +TT			-59.13 +10log ($N_{RB,c}$ /50) +TT			-59.13 +10log ($N_{RB,c}$ /50) +TT		
Propagation Condition		AWGN			AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	-			-			-			≤ TAE		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carri aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9), outside the subframes (m+15) to (m+19) and outside the subframes (m+25) to (m+29).

Figures 8.16.57.5-1 to 8.16.57.5-3 show the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

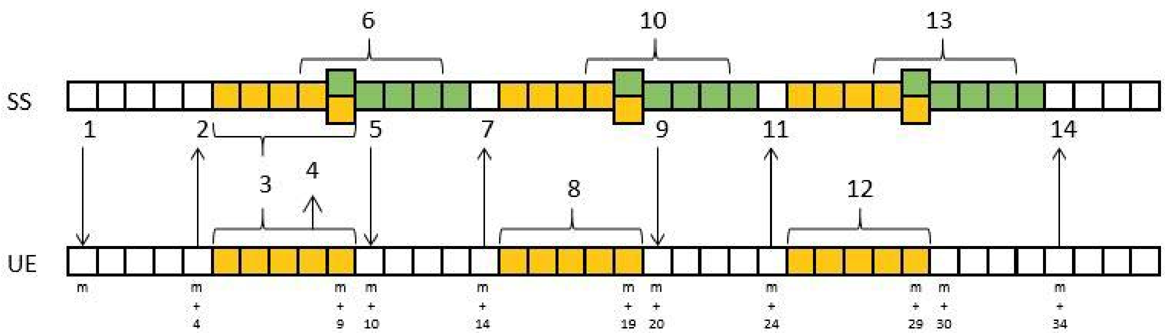

Figure 8.16.57.5-1: Procedure derivation for Activation (All intra-band case)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Activation command for SCell3
10) Possible DTX reception period on SS due to interruption by SCell2 activation
11) ACK for MAC-CE for SCell3 activation
12) Possible interruption period by SCell3 activation
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing (valid CQI)

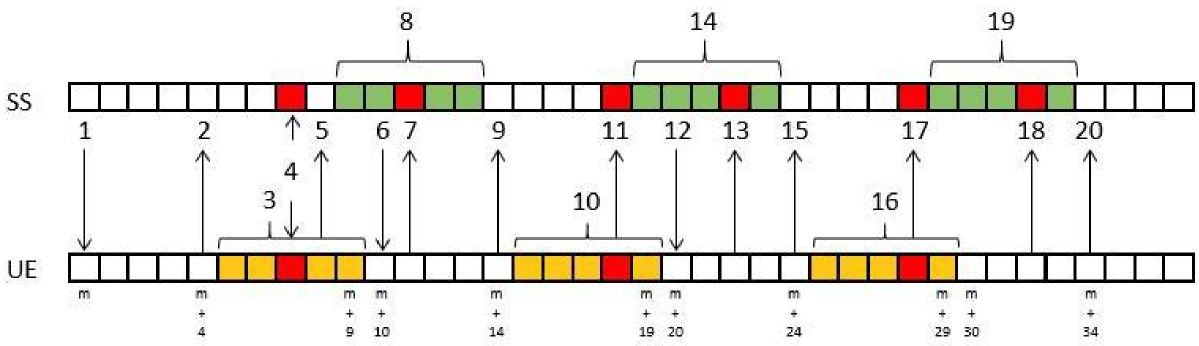

Figure: 8.16.57.5-2 Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS

5) First CSI report timing (could be invalid CQI) at m+8 (might be m+10 due to interruption)

6) Activation command for SCell2

7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation

8) Possible DTX reception period on SS due to interruption by SCell1 activation

9) ACK for MAC-CE for SCell2 activation

10) Possible interruption period by SCell2 activation

11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS

12) Activation command for SCell3

13) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

14) Possible DTX reception period on SS due to interruption by SCell2 activation

15) ACK for MAC-CE for SCell3 activation

16) Possible interruption period by SCell3 activation

17) Allowed interruption timing (1 subframe in m+25~m+29) on UE by SCell3 activation, that is, possible DTX timing on SS

18) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell3 activation

19) Possible DTX reception period on SS due to interruption by SCell3 activation

20) Latest valid CSI report timing (valid CQI)

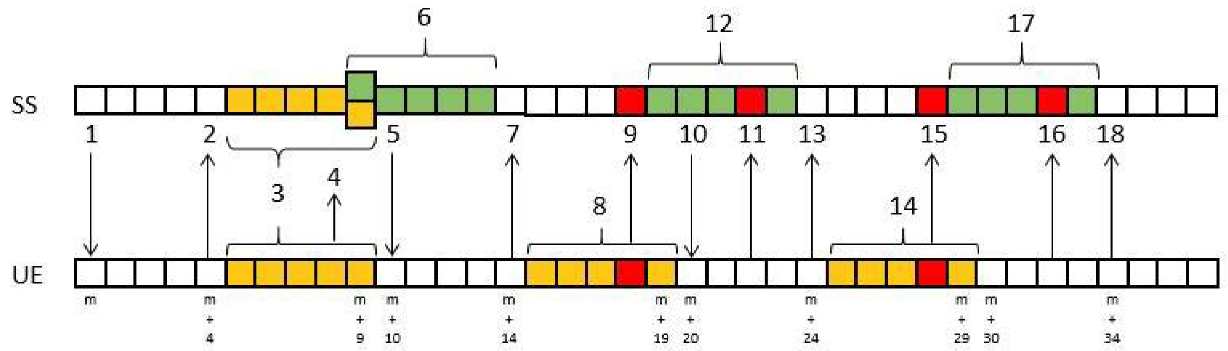

Figure 8.16.57.5-3: Procedure derivation for Activation (The case where the band relation between PCC and SCell1 is intra-band, SCell2 and SCell3 is inter-band)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS
10) Activation command for SCell3
11) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
12) Possible DTX reception period on SS due to interruption by SCell2 activation
13) ACK for MAC-CE for SCell3 activation
14) Possible interruption period by SCell3 activation
15) Allowed interruption timing (1 subframe in m+25~m+29) on UE by SCell3 activation, that is, possible DTX timing on SS
16) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell3 activation
17) Possible DTX reception period on SS due to interruption by SCell3 activation
18) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9), outside the subframes (n+15) to (n+19) and outside the subframes (n+25) to (n+29).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the requirements defined in the Test Procedure shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.58

8.16.59 4 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Applicability Release to be confirmed and necessary FGI bits to be determined

- Square brackets "K_i ($0 \leq K_i \leq [3]$)" *remain in one core requirement, but do not affect this test case*

- The message contents, including titles, are copied from 3DL Test case 8.16.35 and need to be updated for 4DL

- Update of Figure 8.16.59.5-1 to include SCell3 activation for 4DL, and add associated explanation points

- The entry for Annex E is missing

8.16.59.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for UE configured with three downlink SCells, when the SCell is known by the UE at the time of activation and PCell is in FDD.

8.16.59.2 Test applicability

This test applies to all types of E-UTRA UE release [13] and forward that support E-UTRA FDD and TDD and 4DL CA with FDD as PCell. Applicability requires support for FGI bit [FFS].

8.16.59.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in section 7.7.2;

K_i ($0 \leq K_i \leq [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \leq N \leq 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or

    - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.

- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in section TS 36.133 [4] 7.7.3 regardless of whether any other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
    - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clauses 7.7, 7.8 and A.8.16.59.

8.16.59.4 Test description

8.16.59.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.59.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.59.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.59.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, Cell 3 is the deactivated SCell on RF channel number 3 and Cell 4 is the deactivated SCell on RF channel number 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.59.4.1-1: General test parameters for 4 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3, 4	Four radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	s	7	During this time the PCell, SCell2 and SCell3 shall be known and the SCell1 configured and detected.
T2	s	1	During this time the UE shall activate the SCell1, SCell2, and SCell3.
T3	s	1	During this time the UE shall deactivate the SCell1, SCell2, and SCell3.

8.16.59.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are four carriers, each with one cell. All cells have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC), to Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) and to Cell 4 (deactivated SCell3) on radio channel 4 (SCC3), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is monitoring the PCC, SCC2 and SCC3. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC2 and SCC3 according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell2 (Cell 3) on SCC2 and SCell3 (Cell 4) on SCC3 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.59.4.3.
4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.
5. Set the parameters according to T1 in Tables 8.16.59.5-1 and 8.16.59.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.59.4.3.
6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 14.
7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+10).

8. The SS activates SCell3 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+20).

9. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell activation.

    - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

        - or (m+10) if the subframe (m+8) was subject to interruption,

    - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+34),

        - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+34)

    - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,

    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) up to the end of T2,

    - Then the number of successes for the event "Activation" is increased by one. Otherwise, count a fail for the event "Activation" and go to step 14.

10. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 11, otherwise go to step 14.

11. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).

12. The SS deactivates SCell3 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+20).

13. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,

    - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+15) to (n+23) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+25) to (n+33) up to the end of T3

    - Then the number of successes for the event "Deactivation" is increased by one. Otherwise, count a fail for the event "Deactivation".

14. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event "Activation" in step 9, or Deactivation in step 10 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

15. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

16. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

17. Repeat steps 2-16 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.59.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.59.4.3-1: Common Exception messages for 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.59.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.59.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional 3 DL PCell in FDD activation and deactivation of known SCell in non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.59.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [4] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.59.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.59.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.59.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.59.4.3-8: *SystemInformationBlockType2:* Additional 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX condition requirements

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

8.16.59.5 Test requirement

Tables 8.16.59.5-1 and 8.16.59.5-2 define the primary level settings including test tolerances for 4 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX test.

Table 8.16.59.5-1: Cell specific test parameters for 4 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX, Cells 1 to 3

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
Special subframe configuration		-			6			6		
Uplink-downlink configuration		-			1			1		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17			17		
$\hat{E}_s/I_{ot}$	dB	17			17			17		
RSRP Note 3	dBm/15 kHz	-87			-87			-87		
SCH_RP Note 3	dBm/15 kHz	-87			-87			-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)			-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	-			-			-		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.59.5-2: Cell specific test parameters for 4 DL PCell in FDD CA activation and deactivation of known SCell in non-DRX, Cell 4

Parameter	Unit	Cell 4								
		T1	T2	T3						
E-UTRA RF Channel Number		4								
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100								
Special subframe configuration		6								
Uplink-downlink configuration		1								
PDSCH parameters: DL Reference Measurement Channel		-								
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD								
OCNG Patterns		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD								
PBCH_RA	dB	0								
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104								
$\hat{E}_s/N_{oc}$	dB	17								
$\hat{E}_s/I_{ot}$	dB	17								
RSRP Note 3	dBm/15 kHz	-87								
SCH_RP Note 3	dBm/15 kHz	-87								
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)								
Propagation Condition		AWGN								
Antenna Configuration		1x2								
Timing offset to Cell 1	μs	0								
Time alignment error relative to cell 1 Note 5	μs	≤ TAE								
Time alignment error relative to cell 2 Note 5	μs	≤ TAE								
Time alignment error relative to cell 3 Note 5	μs	≤ TAE								

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9), outside the subframes (m+15) to (m+19) and outside the subframes (m+25) to (m+29).

Figure 8.16.59.5-1 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

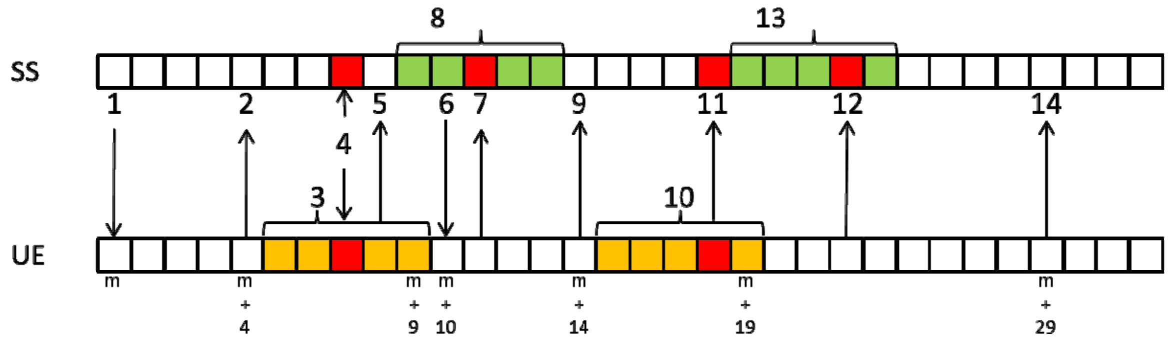

Figure: 8.16.59.5-1 Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band) (FFS)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS
5) First CSI report timing (could be an invalid CQI) at m+8 (might be m+10 due to interruption)
6) Activation command for SCell2
7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation
8) Possible DTX reception period on SS due to interruption by SCell1 activation
9) ACK for MAC-CE for SCell2 activation
10) Possible interruption period by SCell2 activation
11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS
12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9), outside the subframes (n+15) to (n+19) and outside the subframes (n+25) to (n+29).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.60

8.16.61 E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test requirements need to be updated

8.16.61.1 Test purpose

To verify that the SCell activation and deactivation times are within the requirements stated in section 7.7 for UE configured with four downlink SCells, when the SCell is unknown by the UE at the time of activation and PCell is in FDD.

8.16.61.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support 4DL with TDD Intra-band contiguous CA, or 4DL with Inter-band CA, or 4DL with Intra-band contiguous and Inter-band CA. Applicability requires support for FGI bit 25.

This test case also applies to all types of E-UTRA UE release 11 and forward that support 4DL with Intra-band non-contiguous and Inter-band CA or 4DL with Intra-band non-contiguous and Intra-band contiguous CA, or 4DL with Intra-band non-contiguous and Intra-band non-contiguous CA. Applicability requires support for FGI bit 25.

8.16.61.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure the other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if the other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + K*5$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in TS 36.133 [4] section 7.7.2;

K ($1 \le K \le [3]$) is the number of times the other SCell is activated, deactivated, configured or deconfigured while the SCell is being activated;

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:

    - The PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or
    - The activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE is configured to report the CQI for the SCell being activated.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in TS 36.133 [4] section 7.7.3 regardless of whether the other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
    - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clause 7.7 and A.8.16.61.

8.16.61.4 Test description

8.16.61.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.61.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.61.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.61.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell1 on RF channel number 2, Cell 3 is the deactivated SCell2 on RF channel number 3, and Cell 4 is the SCell3 on RF channel number 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.61.4.1-1: General test parameters for unknown SCell1 activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3,4	Four radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured SCell1		Cell 2	Deconfigured secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
Filter coefficient		0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell, SCell2 and SCell3 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1.
T3	s	1	During this time the UE shall deactivate the SCell1.

8.16.61.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are four carriers, each with one cell. Cell 1, Cell 3, and Cell 4 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell1 (PCell) on radio channel 1 (PCC), Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) and Cell4 (deactivated SCell3) on radio channel 4 (SCC3), but is not aware of Cell2 (SCell1) on radio channel 2 (SCC1). The UE is only monitoring the PCC, SCC2 and SCC3. The UE shall be continuously scheduled in the PCell throughout the whole test.

During T2, the Test procedure requires the UE to send the first CSI report for SCell1 in a subframe (m+8), but also allows a subframe (m+10) if the subframe (m+8) was subject to interruption. The SS determines whether the CSI report in subframe (m+8) was interrupted or not by monitoring ACK/NACK sent in PCell in subframe (m+8).

NOTE: The requirements are dependant on the CA configuration (e.g. intra band, inter band; see TS 36.133 [4], clause 7.8) hence the test procedure has been divided into three variants, found in steps 8a, 8b and 8c and in steps 11a, 11b and 11c. Depending on the CA configuration under test only one of those shall be run respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 and SCC3 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on the SCC2 and SCell3 (Cell 4) on the SCC3 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.61.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Table 8.16.61.5-1. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The

SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.61.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 12.

7. The SS activates SCell2 and SCell3 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (m+10) and subframe (m+20) respectively.

8. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell activation..

8a. For all intra-band case

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+10) if the subframe (m+8) was subject to interruption
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)
- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes(m+25) to (m+33) up to the end of T2
- Then the number of successes for the event "Activation" is increased by one, Otherwise, count a fail for the event "Activation" and go to step 12.

8b. For the case where the band relation between PCC and SCells are inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8)
  - or (m+10) if the subframe (m+8) was subject to interruption,
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)
- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes(m+25) to (m+33) up to the end of T2,
- and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes(m+25) to (m+33) up to the end of T2,
- Then the number of successes for the event "Activation" is increased by one, Otherwise, count a fail for the event "Activation" and go to step 12.

8c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band

- If the first CSI report for SCell1 is received by the SS in a subframe (m+8),
  - or (m+10) if the subframe (m+8) was subject to interruption
- and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),
  - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)
- and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes(m+25) to (m+33) up to the end of T2,
- and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) up to the end of T2,

- Then the number of successes for the event “Activation” is increased by one, Otherwise, count a fail for the event “Activation” and go to step 12.

9. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 10, otherwise go to step 12.

10. The SS deactivates SCell2 and SCell3 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10) and subframe (n+20) respectively.

11. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

    11a. For all intra-band case

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframe (n+25) to (n+33) up to the end of T3,
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11b. For the case where the band relation between PCC and SCells are inter-band

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
    - and $\leq$2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

    11c. For the case where the band relation between PCC and SCell1 is intra-band and SCell2 is inter-band,

    - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),
    - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,
    - and $\leq$2 non-consecutive DTX subframes are observed by the SS the subframes (n+25) to (n+33) up to the end of T3,
    - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

12. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 8a, 8b or 8c, or Deactivation in step 9 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

13. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

14. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3,

15. Repeat steps 2-14 until a test verdict has been achieved,

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.61.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.61.4.3-1: Common Exception messages for E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.61.4.3-2: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell activation

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.61.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.61.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.61.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.61.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.61.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.61.4.3-8: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.61.4.3-9: *QuantityConfig-DEFAULT:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
}			

Table 8.16.61.4.3-10: *SystemInformationBlockType2:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

Table 8.16.61.4.3-11: *SystemInformationBlockType3:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-2 SystemInformationBlockType3 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

Table 8.16.61.4.3-12: *SystemInformationBlockType5:* Additional E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-3 SystemInformationBlockType5 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType5 ::= SEQUENCE {			
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 1, Cell 2, Cell 3
}			

8.16.61.5 Test requirement

Table 8.16.61.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD 4DL CA activation and deactivation of unknown SCell in non-DRX.

Table 8.16.61.5-1: Cell specific test parameters for E-UTRAN FDD 4DL CA activation and deactivation of known SCell in non-DRX

Parameter	Unit	Cell 1			Cell 2			Cell 3			Cell 4		
		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3			4		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD			5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD		
PBCH_RA	dB	0			0			0			0		
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB												
PCFICH_RB	dB												
PHICH_RA	dB												
PHICH_RB	dB												
PDCCH_RA	dB												
PDCCH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA Note 1	dB												
OCNG_RB Note 1	dB												
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17+TT			-infinity	17+TT		17+TT			17+TT		
$\hat{E}_s/I_{ot}$ Note 3	dB	17+TT			-infinity	17+TT		17+TT			17+TT		
RSRP Note 3	dBm/15 kHz	-87+TT			-infinity	-87+TT		-87+TT			-87+TT		
SCH_RP Note 3	dBm/15 kHz	-87+TT			-infinity	-87+TT		-87+TT			-87+TT		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)+TT			-76.22 +10log ($N_{RB,c}$ /50) +TT	-59.13 +10log ($N_{RB,c}$ /50) +TT		-59.13 +10log ($N_{RB,c}$ /50)+TT			-59.13 +10log ($N_{RB,c}$ /50)+TT		
Propagation Condition		AWGN			AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	-			-			-			≤ TAE		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carri aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9), outside the subframes (m+15) to (m+19) and outside the subframes (m+25) to (m+29).

Figures 8.16.61.5-1 to 8.16.61.5-3 show the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

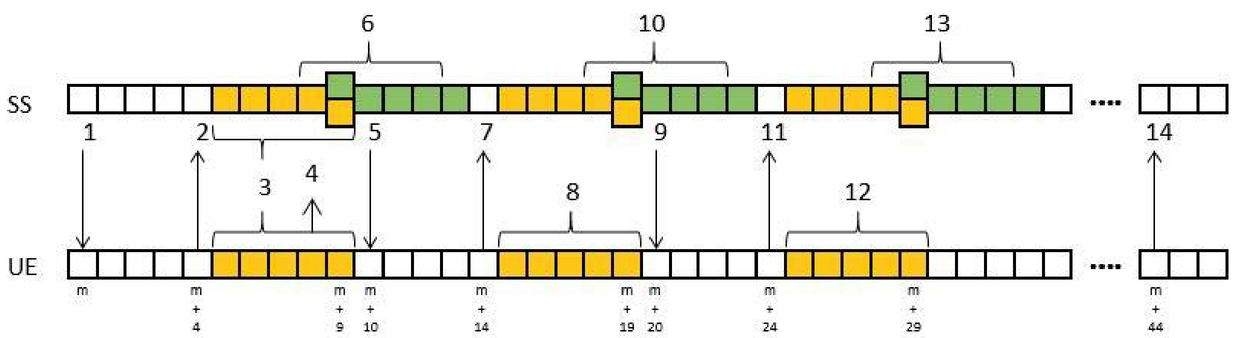

Figure 8.16.61.5-1: Procedure derivation for Activation (all intra-band case)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Activation command for SCell3
10) Possible DTX reception period on SS due to interruption by SCell2 activation
11) ACK for MAC-CE for SCell3 activation
12) Possible interruption period by SCell3 activation
13) Possible DTX reception period on SS due to interruption by SCell2 activation

14) Latest valid CSI report timing (valid CQI)

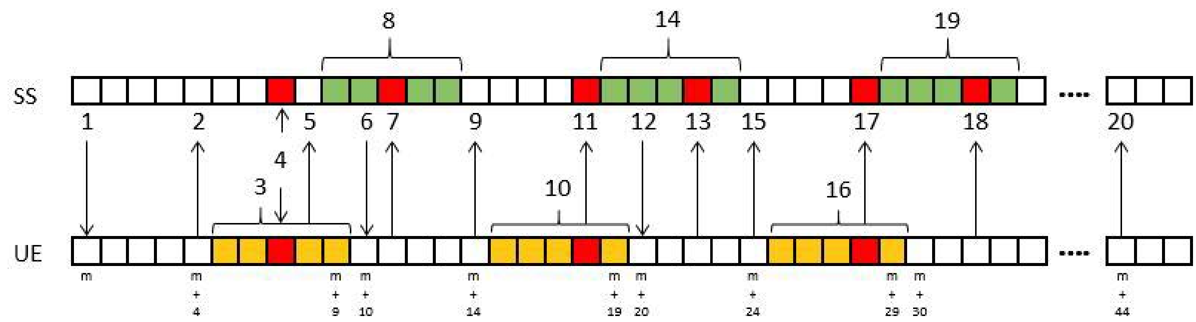

Figure 8.16.61.5-2: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band)

1) Activation command for SCell1 (T2 starts)

2) ACK for MAC-CE for SCell1 activation

3) Possible interruption period by SCell1 activation

4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS

5) First CSI report timing (could be invalid CQI) at m+8 (might be m+10 due to interruption)

6) Activation command for SCell2

7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation

8) Possible DTX reception period on SS due to interruption by SCell1 activation

9) ACK for MAC-CE for SCell2 activation

10) Possible interruption period by SCell2 activation

11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS

12) Activation command for SCell3

13) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation

14) Possible DTX reception period on SS due to interruption by SCell2 activation

15) ACK for MAC-CE for SCell3 activation

16) Possible interruption period by SCell3 activation

17) Allowed interruption timing (1 subframe in m+25~m+29) on UE by SCell3 activation, that is, possible DTX timing on SS

18) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell3 activation

19) Possible DTX reception period on SS due to interruption by SCell3 activation

20) Latest valid CSI report timing (valid CQI)

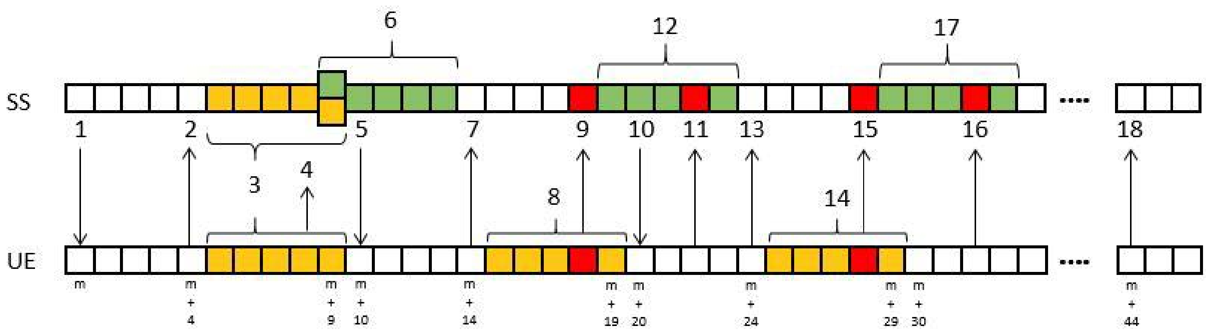

Figure 8.16.61.5-3: Procedure derivation for Activation (The case where the band relation between PCC and SCell1 is intra-band, SCell2 and SCell3 is inter-band)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) First CSI report timing (could be invalid CQI)
5) Activation command for SCell2
6) Possible DTX reception period on SS due to interruption by SCell1 activation
7) ACK for MAC-CE for SCell2 activation
8) Possible interruption period by SCell2 activation
9) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS
10) Activation command for SCell3
11) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
12) Possible DTX reception period on SS due to interruption by SCell2 activation
13) ACK for MAC-CE for SCell3 activation
14) Possible interruption period by SCell3 activation
15) Allowed interruption timing (1 subframe in m+25~m+29) on UE by SCell3 activation, that is, possible DTX timing on SS
16) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell3 activation
17) Possible DTX reception period on SS due to interruption by SCell3 activation
18) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9), outside the subframes (n+15) to (n+19) and outside the subframes (n+25) to (n+29).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the requirements defined in the Test Procedure shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.16.62

8.16.63 4 DL PCell in FDD CA Activation and Deactivation of Unknown SCell in Non-DRX

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Applicability Release to be confirmed and necessary FGI bits to be determined

- Square brackets "K_i ($0 \le K_i \le [3]$)" *remain in one core requirement, but do not affect this test case*

- The message contents, including titles, are copied from 3DL Test case 8.16.39 and need to be updated for 4DL

- Update of Figure 8.16.63.5-1 to include SCell3 activation for 4DL, and add associated explanation points

- The entry for Annex E is missing

8.16.63.1 Test purpose

To verify that SCell activation and deactivation times are within the requirements in TS 36.133 [4] section 7.7 for UE configured with three downlink SCells, when the SCell is unknown by the UE at the time of activation and PCell is in FDD.

8.16.63.2 Test applicability

This test applies to all types of E-UTRA UE release [13] and forward that support E-UTRA FDD and TDD and 4DL CA with FDD as PCell. Applicability requires support for FGI bit [FFS].

8.16.63.3 Minimum conformance requirements

While activating a SCell if the UE does not receive any command to activate, deactivate, configure or deconfigure any other SCell during the SCell activation delay then the UE shall meet the SCell activation delay requirements specified in TS 36.133 [4] section 7.7.2.

While activating a SCell if any other SCell is activated, deactivated, configured or deconfigured by the UE then the UE shall meet the SCell activation delay requirements ($T_{activate\_total}$) according to the following expression:

$$T_{activate\_total} = T_{activate\_basic} + 5 \times \sum_{i=1}^{N-1} K_i$$

Where:

$T_{activate\_total}$ is the total time to activate a SCell and is expressed in subframes.

$T_{activate\_basic}$ is the SCell activation delay specified in section 7.7.2;

K_i ($0 \le K_i \le [3]$) is the number of times the other i^{th} SCell is activated, deactivated, configured or deconfigured while the SCell is being activated.

N ($2 \le N \le 4$) is the maximum number of SCells supported by the UE.

While activating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell activation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
  - the PCell and/or the activated SCell being interrupted and the SCell being activated belong to E-UTRA TDD, or

    - the activated SCell being interrupted and the SCell being activated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.

- Otherwise, the interruption on PCell and/or on the activated SCell due to the SCell activation specified in TS36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

Starting from the subframe specified in section 4.3 of TS 36.213 [8] and until the UE has completed the SCell activation, the UE shall report CQI index = 0 (out of range) if the UE has available uplink resources to report CQI for an SCell.

The UE shall deactivate a SCell and meet the SCell deactivation delay requirements specified in section TS 36.133 [4] 7.7.3 regardless of whether any other SCell is activated, deactivated, configured or deconfigured or not by the UE during the SCell deactivation delay.

While deactivating a SCell:

- The interruption on the PCell and/or on the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+11 if:
    - The PCell and/or the activated SCell being interrupted and the SCell being deactivated belong to E-UTRA TDD or
    - The activated SCell being interrupted and the SCell being deactivated belong to E-UTRA FDD and the PCell belongs to E-UTRA TDD.
- Otherwise, the interruption on PCell and/or the activated SCell due to the SCell deactivation specified in TS 36.133 [4] section 7.8.2 shall not occur before subframe *n*+5 and not occur after subframe *n*+9.

The normative reference for this requirement is TS 36.133 [4] clauses 7.7, 7.8 and A.8.16.59.

8.16.63.4 Test description

8.16.63.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.16.63.5-1 as defined in TS 36.508 [7] clause 4.3.1, for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.63 as appropriate.
2. The general test parameter settings are set up according to Table 8.16.63.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.16.63.4.3.
5. Cell 1 is the PCell on the primary component carrier, Cell 2 is the SCell on RF channel number 2, Cell 3 is the deactivated SCell on RF channel number 3 and Cell 4 is the deactivated SCell on RF channel number 4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3 and Cell 4 shall be powered OFF.

Table 8.16.63.4.1-1: General test parameters for 4 DL PCell in FDD CA activation and deactivation of unknown SCell in non-DRX

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2, 3, 4	Four radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Deconfigured deactivated SCell1		Cell 2	Deconfigured deactivated secondary cell on RF channel number 2.
Configured deactivated SCell2		Cell 3	Configured deactivated secondary cell on RF channel number 3.
Configured deactivated SCell3		Cell 4	Configured deactivated secondary cell on RF channel number 4.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Cell-individual offset for cells on RF channel number 1	dB	0	Individual offset for cells on PCC.
Cell-individual offset for cells on RF channel number 2	dB	0	Individual offset for cells on SCC1.
Cell-individual offset for cells on RF channel number 3	dB	0	Individual offset for cells on SCC2.
Cell-individual offset for cells on RF channel number 4	dB	0	Individual offset for cells on SCC3.
SCell measurement cycle (measCycleSCell)	ms	320	
T1	ms	100	During this time the PCell, SCell2 and SCell3 shall be known and the SCell1 configured.
T2	s	1	During this time the UE shall activate the SCell1, SCell2, and SCell3.
T3	s	1	During this time the UE shall deactivate the SCell1, SCell2, and SCell3.

8.16.63.4.2 Test procedure

The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. There are four carriers, each with one cell. Cell 1, Cell 3 and Cell 4 have constant signal levels throughout the test.

Before the test starts the UE is connected to Cell 1 (PCell) on radio channel 1 (PCC), to Cell 3 (deactivated SCell2) on radio channel 3 (SCC2) and to Cell 4 (deactivated SCell3) on radio channel 4 (SCC3), but is not aware of Cell 2 (SCell1) on radio channel 2 (SCC1). The UE is monitoring the PCC, SCC2 and SCC3. The UE shall be continuously scheduled in the PCell throughout the whole test.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC2 and SCC3 according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell2 (Cell 3) on SCC2 and SCell3 (Cell 4) on SCC3 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.63.4.3.

4. The SS shall configure transmission of PDSCH with a maximum number of 1 HARQ transmission.

5. Set the parameters according to T1 in Tables 8.16.63.5-1 and 8.16.63.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts. Configure SCC1 according to Annex C.0, C.1 for all downlink physical channels. The SS shall configure SCell1 (Cell 2) on the SCC1 as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.16.63.4.3.

6. The SS activates SCell1 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted m which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T2 starts in subframe m, and the test proceeds to step 7, otherwise go to step 14.

7. The SS activates SCell2 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+10).

8. The SS activates SCell3 by sending the activation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in subframe (m+20).

9. The UE shall start sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell activation.

   - If the first CSI report for SCell1 is received by the SS in a subframe (m+8),

     - or (m+10) if the subframe (m+8) was subject to interruption,

   - and CSI report with non-zero CQI index is received by the SS earlier than or equal to subframe (m+44),

     - or the next available uplink resource if there are no uplink resources for reporting the valid CSI in a subframe (m+44)

   - and DTX is not observed by the SS anywhere outside the subframes (m+5) to (m+13), the subframes (m+15) to (m+23) and the subframes (m+25) to (m+33) up to the end of T2,

   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (m+5) to (m+13), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+15) to (m+23) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (m+25) to (m+33) up to the end of T2,

   - Then the number of successes for the event “Activation” is increased by one. Otherwise, count a fail for the event “Activation” and go to step 14.

10. When T2 expires, the SS deactivates SCell1 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe # denoted n which is an even number. If the SS receives ACK for MAC-CE sent by the UE, T3 starts in subframe n, and the test proceeds to step 11, otherwise go to step 14.

11. The SS deactivates SCell2 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+10).

12. The SS deactivates SCell3 by sending the deactivation MAC-CE (Refer TS 36.321 [26], clauses 5.13, 6.1.3.8) in a subframe (n+20).

13. The UE shall stop sending CSI reports for SCell1 and the SS shall monitor CSI reports for SCell1 sent from the UE and ACK/NACK sent in PCell during SCell1 deactivation.

   - If the last CSI report is received by the SS earlier than or equal to subframe (n+8),

   - and DTX is not observed by the SS anywhere outside the subframes (n+5) to (n+13), the subframes (n+15) to (n+23) and the subframes (n+25) to (n+33) up to the end of T3,

   - and ≤2 non-consecutive DTX subframes are observed by the SS anywhere during the subframes (n+5) to (n+13), ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+15) to (n+23) and ≤2 non-consecutive DTX subframes are observed by the SS during the subframes (n+25) to (n+33) up to the end of T3

   - Then the number of successes for the event “Deactivation” is increased by one. Otherwise, count a fail for the event “Deactivation”.

14. When T3 expires, or Activation in step 6 was not acknowledged, or a fail was counted for the event “Activation” in step 9, or Deactivation in step 10 was not acknowledged, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

15. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

16. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

17. Repeat steps 2-16 until a test verdict has been achieved.

Each of the events “Activation” and “Deactivation” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.16.63.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.16.63.4.3-1: Common Exception messages for E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	

Table 8.16.63.4.3-2: *PhysicalConfigDedicated-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT using condition CQI_PERIODIC		RBC
cqi-ReportConfig-r10	Not present		SCell_AddMod
}			

Table 8.16.63.4.3-3: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	Not present		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	158		
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	NULL		
simultaneousAckNackAndCQI	TRUE		
}			
}			
}			

Table 8.16.63.4.3-4: *PhysicalConfigDedicatedSCell-r10-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicatedSCell-r10-DEFAULT ::= SEQUENCE {			
ul-Configuration-r10 SEQUENCE {			
antennaInfoUL-r10	Not present		
pusch-ConfigDedicatedSCell-r10	Not present		
uplinkPowerControlDedicatedSCell-r10	Not present		
cqi-ReportConfigSCell-r10	CQI-ReportConfigSCell-r10-DEFAULT		SCell1
soundingRS-UL-ConfigDedicated-r10	Not present		
soundingRS-UL-ConfigDedicated-v1020	Not present		
soundingRS-UL-ConfigDedicatedAperiodic-r10	Not present		
}			
}			

Table 8.16.63.4.3-5: *CQI-ReportConfigSCell-r10-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfigSCell-r10 ::= SEQUENCE {			
cqi-ReportModeAperiodic-r10	Not present		
nomPDSCH-RS-EPRE-Offset-r10	0		
cqi-ReportPeriodicSCell-r10			
	CQI-ReportPeriodic-r10-DEFAULT		CQI_PERIODIC
pmi-RI-Report-r10	Not present		
}			

Table 8.16.63.4.3-6: *CQI-ReportPeriodic-r10-DEFAULT: Additional E-UTRAN* TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportPeriodic-r10 ::= CHOICE {			
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex-r10	0		
cqi-PUCCH-ResourceIndexP1-r10	Not present		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	Cell2
cqi-FormatIndicatorPeriodic-r10 CHOICE {			
widebandCQI-r10 SEQUENCE {			
csi-ReportMode-r10	Not present		
}			
ri-ConfigIndex	484	(see Table 7.2.2-1B in TS 36.213)	Cell2
simultaneousAckNackAndCQI	TRUE		
cqi-Mask-r9	Not present		
csi-ConfigIndex-r10	Not present		
}			
}			
}			

Table 8.16.63.4.3-7: *MeasObjectEUTRA-GENERIC:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 4.6.6 Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		Cell 2, Cell 3
}			

Table 8.16.63.4.3-8: *SystemInformationBlockType2:* Additional E-UTRAN TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD

Derivation Path: TS 36.508 [7] clause 7.2.1.3, Table 7.2.1.3-1 SystemInformationBlockType2 exceptions			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfig	Not present		Cell 1
}			

8.16.63.5 Test requirement

Tables 8.16.63.5-1 and 8.16.63.5-2 define the primary level settings including test tolerances for 4 DL PCell in FDD CA activation and deactivation of unknown SCell in non-DRX test.

Table 8.16.63.5-1: Cell specific test parameters for 4 DL PCell in FDD CA activation and deactivation of unknown SCell in non-DRX, Cells 1 to 3

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			3		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
Special subframe configuration		-			6			6		
Uplink-downlink configuration		-			1			1		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD			5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104			-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			-infinity	17		17		
$\hat{E}_s/I_{ot}$	dB	17			-infinity	17		17		
RSRP Note 3	dBm/15 kHz	-87			-infinity	-87		-87		
SCH_RP Note 3	dBm/15 kHz	-87			-infinity	-87		-87		
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)			-76.22 +10log ($N_{RB,c}$ /50)	-59.13 +10log ($N_{RB,c}$ /50)		-59.13 +10log ($N_{RB,c}$ /50)		
Propagation Condition		AWGN			AWGN			AWGN		
Antenna Configuration		1x2			1x2			1x2		
Timing offset to Cell 1	µs	-			0			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			≤ TAE		
Time alignment error relative to cell 2 Note 5	µs	-			-			≤ TAE		
Time alignment error relative to cell 3 Note 5	µs	-			-			-		

Note 1:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 8.16.63.5-2: Cell specific test parameters for 4 DL PCell in FDD CA activation and deactivation of unknown SCell in non-DRX, Cell 4

Parameter	Unit	Cell 4								
		T1	T2	T3						
E-UTRA RF Channel Number		4								
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100								
Special subframe configuration		6								
Uplink-downlink configuration		1								
PDSCH parameters: DL Reference Measurement Channel		-								
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD								
OCNG Patterns		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD								
PBCH_RA	dB	0								
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-104								
$\hat{E}_s/N_{oc}$	dB	17								
$\hat{E}_s/I_{ot}$	dB	17								
RSRP Note 3	dBm/15 kHz	-87								
SCH_RP Note 3	dBm/15 kHz	-87								
Io Note 3	dBm/Ch BW	-59.13 +10log ($N_{RB,c}$ /50)								
Propagation Condition		AWGN								
Antenna Configuration		1x2								
Timing offset to Cell 1	μs	0								
Time alignment error relative to cell 1 Note 5	μs	≤ TAE								
Time alignment error relative to cell 2 Note 5	μs	≤ TAE								
Time alignment error relative to cell 3 Note 5	μs	≤ TAE								

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.

Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 interruption of PCell during SCells activation shall not happen outside the subframes (m+5) to (m+9), outside the subframes (m+15) to (m+19) and outside the subframes (m+25) to (m+29).

Figure 8.16.63.5-1 shows the derivation of the Test procedure requirements for DTX during T2, based on the core requirements for interruption.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

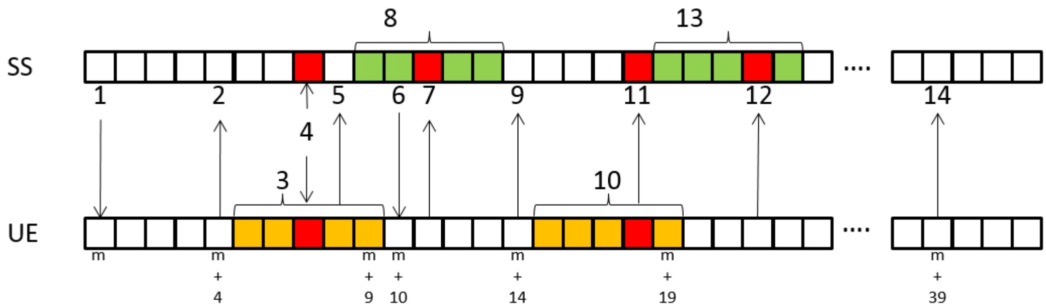

Figure: 8.16.63.5-1: Procedure derivation for Activation (the case where the band relation between PCC and SCells are inter-band) (FFS)

1) Activation command for SCell1 (T2 starts)
2) ACK for MAC-CE for SCell1 activation
3) Possible interruption period by SCell1 activation
4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell1 activation, that is, possible DTX timing on SS
5) First CSI report timing (could be an invalid CQI) at m+8 (might be m+10 due to interruption)
6) Activation command for SCell2
7) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell1 activation
8) Possible DTX reception period on SS due to interruption by SCell1 activation
9) ACK for MAC-CE for SCell2 activation
10) Possible interruption period by SCell2 activation
11) Allowed interruption timing (1 subframe in m+15~m+19) on UE by SCell2 activation, that is, possible DTX timing on SS
12) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell2 activation
13) Possible DTX reception period on SS due to interruption by SCell2 activation
14) Latest valid CSI report timing (valid CQI)

During T3 interruption of PCell during SCells deactivation shall not happen outside the subframes (n+5) to (n+9), outside the subframes (n+15) to (n+19) and outside the subframes (n+25) to (n+29).

The derivation of the Test procedure requirements for DTX during T3 is based on the core requirements for interruption, using the applicable figure according to the CA configuration, in a similar way to T2.

All of the above test requirements shall be fulfilled in order for the observed SCell1 activation delay and SCell1 deactivation delay to be counted as correct. The rate of correct observed SCell1 activation delay and SCell1 deactivation delay during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.17 RSTD Measurements for E-UTRAN Carrier Aggregation

The RSTD measurements for EUTRAN Carrier Aggregation test cases can be found in TS 37.571-1 [27].

8.18 E-UTRAN TDD – HRPD Measurements

8.18.1 E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

8.18.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - HRPD cell search requirements.

8.18.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support HRPD. Applicability requires support for FGI bit 15.

8.18.1.3 Minimum requirement

UE shall perform HRPD measurements according to the procedure defined in 3GPP2 C.S0024-B on the HRPD neighbour cells indicated by the serving eNode B. If measurement gaps are required, the UE shall perform HRPD measurements only during the measurement gaps configured by the serving eNode B.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.12 and A.8.18.1.

8.18.1.4 Test description

8.18.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.

2. The general test parameter settings are set up according to Table 8.18.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.18.1.4.3.

5. There is one E-UTRA TDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.18.1.4.1-1: General test parameters for E-UTRAN TDD to HRPD event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRAN TDD cell
Neighbouring cell		Cell 2	HRPD cell
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN TDD measurement quantity		RSRP	
Inter-RAT (HRPD) measurement quantity		CDMA2000 HRPD Pilot Strength	
b1-ThresholdCDMA2000	dB	-7	Absolute ‘CDMA2000 HRPD Pilot Strength’ threshold for event B1
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	Non-DRX test
Access Barring Information	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number		1	One HRPD carrier frequency is used.
HRPD neighbour cell list size		8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1	s	5	
T2	s	3	

8.18.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Tables 8.18.1.5-1 and 8.18.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.19.1.5-1 and 8.19.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 2136 ms then the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different PN Offset on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.18.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.18.1.4.3-1: Common Exception messages for E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.18.1.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f14	f14 is the frequency of the neighbouring cell(CDMA2000 Cell)	
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f14		
reportConfigId	IdReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		CDMA2000
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.18.1.4.3-3: *ReportConfigInterRAT-B1-CDMA2000*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-CDMA2000(CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdCDMA2000 CHOICE {			
ThresholdCDMA2000	14(-7)	-2*10*log10(Ec/Io) in units of 0.5dB, see C.S0005-A for details	
}			
}			
}			
}			
hysteresis	0		
}			
}			
}			

Table 8.18.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
MeasResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 8.18.1.4.3-5: *MeasResultsCDMA2000*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000::= SEQUENCE {			
preRegistrationStatusHRPD	true		
measResultListCDMA2000	MeasResultListCDMA2000		
}			

Table 8.18.1.4.3-6: *MeasResultListCDMA2000*: Additional E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListCDMA2000::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellIdCDMA2000		
measResult SEQUENCE {			
pilotStrength	6(-3)	-2*10*log10(Ec/Io) in units of 0.5dB, see C.S0005-A for details	
}			
}			

8.18.1.5 Test requirement

Tables 8.18.1.4.1-1, 8.18.1.5-1 and 8.18.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - HRPD event triggered reporting under fading propagation conditions test.

Table 8.18.1.5-1: Cell specific test parameters for E-UTRAN TDD cell#1 for event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 1 (E-UTRA)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-98 +TT	-98+TT
$\hat{E}_s/N_{oc}$	dB	0	0
$\hat{E}_s/I_{ot}$	dB	0+TT	0+TT
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.18.1.5-2: Cell specific test parameters for HRPD (cell # 2) for event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 2 (HRPD)	
		T1	T2
Control $\frac{E_b}{N_t}$ (38.4 kbps)	dB	21	
Control $\frac{E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3+TT
Propagation Condition		ETU70	

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{measurement\_HRPD} = T_{measurement\_CDMA2000\_1x}$

$$T_{measurement\_CDMA2000\_1x} = T_{basic\_measurement\_CDMA2000\_1x} \cdot N_{Freq} \cdot S_{gap}$$

$T_{basic\_identify\_UTRA\_TDD}$ = 100 ms

N_{Freq} = 1

S_{gap} = 64/3

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2136 ms in this test case (note: this gives a total of 2134 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.19 E-UTRAN TDD – CDMA2000 1X Measurements

8.19.1 E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

8.19.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD-CDMA2000 1X inter-frequency cell search requirements.

8.19.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support cdma2000 1xRTT. Applicability requires support for FGI bit 15.

8.19.1.3 Minimum conformance requirements

When measurement gaps are scheduled for CDMA2000 1xRTT inter RAT measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CDMA2000 1xRTT Pilot Strength measurements to higher layers with measurement accuracy as specified in TS36.133 [4] Section 9.5, corresponding to a 90% measurement success rate, with measurement period given by

$$\mathrm{T}_{\mathrm{measurement\_CDMA2000\_1x}} = \mathrm{T}_{\mathrm{basic\_measurement\_CDMA2000\_1x}} \cdot N_{Freq} \cdot S_{gap}$$

where $\mathrm{T}_{\mathrm{basic\_measurement\_CDMA2000\_1x}}$ = 100 ms and the measurement gap specific scale factor $\mathrm{S}_{\mathrm{gap}}$ is based on the measurement gap pattern in use as defined in Table 8.19.1.3-1. If inter-frequency RSTD measurements are configured as a part of the measurement configuration, $\mathrm{S}_{\mathrm{gap}}$ shall be based to the Gap Pattern Id 1.

Table 8.19.1.3-1: Gap Pattern Specific Scale Factor

Gap Pattern Id	$\mathrm{S}_{\mathrm{gap}}$
0	32/3
1	64/3

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The measurement reporting delay of each periodic report is defined as the time between the end of the last measurement period and the moment when the UE starts to transmit the measurement report over the Uu interface. This delay shall be less than $\mathrm{T}_{71\mathrm{m}}$ defined in 3GPP2 C.S0005-D for each periodic report. This measurement reporting delay excludes a delay which is caused by the unavailability of the uplink resources for the UE to send the measurement report.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.10 and A.8.19.1.

8.19.1.4 Test description

8.19.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.23.

2. The general test parameter settings are set up according to Table 8.19.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.19.1.4.3.

5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.19.1.4.1-1: General test parameters for E-UTRAN TDD-CDMA2000 1X event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on CDMA2000 1X RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
CDMA2000 1X Channel Number		1	One CDMA2000 1X carrier frequency is used.
Inter-RAT (CDMA2000 1X) measurement quantity		CDMA2000 1xRTT Pilot Strength	
B1-Threshold-CDMA2000	dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B1
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
cdma2000 1X neighbour cell list size		8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1	s	5	
T2	s	3	

8.19.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3. Cell 1 is the active cell.

2. Set the parameters according to T1 in Tables 8.19.1.5-1 and 8.19.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.19.1.5-1 and 8.19.1.5-2.

6. The UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 2136 ms then the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different PN Offset on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.19.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.19.1.4.3-1: Common Exception messages for E-UTRAN TDD – CDMA 2000 1X event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.18.1.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f17	f17 is the frequency of the neighbouring cell(CDMA2000 Cell)	
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f17		
reportConfigId	IdReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		CDMA2000
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.19.1.4.3-3: *ReportConfigInterRAT-B1-CDMA2000*: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-CDMA2000 (CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-Threshold CDMA2000	28(-14)	INTEGER (0..63)	CDMA2000
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.19.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 8.19.1.4.3-5: MeasResultsCDMA2000: Additional E-UTRAN TDD – CDMA 2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000::= SEQUENCE (			
preRegistrationStatusHRPD	FALSE		
measResultListCDMA2000	MeasResultListCDMA2000		
}			

Table 8.19.1.4.3-6: MeasResultListCDMA2000: Additional E-UTRAN TDD – CDMA2000 1X event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListCDMA2000::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCDMA2000 {			
MeasResultCDMA2000 ::= SEQUENCE {			
physCellId	PhysCellIdCDMA2000		
measResult ::= SEQUENCE {			
pilotStrength	20 (-10)	INTEGER (0..63)	
}			
}			
}			

8.19.1.5 Test requirement

Tables 8.19.1.4.1-1, 8.19.1.5-1 and 8.19.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions.

Table 8.19.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of CDMA2000 1X cell under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Correlation Matrix and Antenna Configuration		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
$\hat{E}_s/N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94+TT	-94+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.19.1.5-2: Cell specific test parameters for CDMA2000 1X (cell # 2) for event triggered reporting of CDMA2000 1X cell under fading propagation conditions

Parameter	Unit	Cell 2 (cdma2000 1X)	
		T1	T2
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10+TT
Propagation Condition		ETU70	

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE sends one Event B1 triggered measurement report including PN offset of Cell 2.

The actual overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $\mathrm{T}_{\text{measurement\_CDMA2000\_1x}}$

$$\mathrm{T}_{\text{measurement\_CDMA2000\_1x}} = \mathrm{T}_{\text{basic\_measurement\_CDMA2000\_1x}} \cdot N_{Freq} \cdot S_{gap}$$

$\mathrm{T}_{\text{basic\_measurement\_CDMA2000\_1x}}$ = 100 ms.

N_{Freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

S_{gap}=64/3. It is based on the measurement gap pattern in use as defined in Table 8.19.1.3-1.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 2136 ms in this test case (note: this gives a total of 2134 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20 Inter-frequency/RAT Measurements in CA mode

8.20.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.20.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements in CA mode. This test will partly verify the FDD-FDD inter-frequency cell search requirements.

8.20.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,

- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,

- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period given by table 8.20.1.3-1.

Table 8.20.1.3-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.20.1.3-1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.20.1.

8.20.1.4 Test description

8.20.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.43 as appropriate.

2. The general test parameter settings are set up according to Table 8.20.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.1.4.3.

5. There are three E-UTRA FDD carriers and three cells specified in the test. Cell 1 is the PCell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 is the inter-frequency neighbour cell, Cell 3 is the SCell. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.1.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One FDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Cell2 timing offset to cell1	ms	3	Asynchronous cells
Cell3 timing offset to cell1	µs	0	Synchronous cells
Time alignment error between cell3 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	5	

8.20.1.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3 The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.1.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.20.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. The SS shall transmit an RRCConnectionReconfiguration message with event A3 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.20.1.5-1.

9. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5

Table 8.20.1.4.3-2: *MeasConfig:* Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.20.1.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.20.1.5 Test requirement

Tables 8.20.1.4.1-1 and 8.20.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.20.1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD		OP.1 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	90.3	-94	-94
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.7	4	4
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; $2xTTI_{DCCH}$ = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.20.2.1 Test purpose

To verify the UE’s ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements in CA mode. This test will partly verify the TDD-TDD inter-frequency cell search requirements.

8.20.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP and RSRP Ês/Iot according to Annex I.2.3 for a corresponding Band,

- other RSRP related side conditions given in TS 36.133 [4] Sections 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,

- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively, with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.20.2.3-1.

Table 8.20.2.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$..

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.20.2.

8.20.2.4 Test description

8.20.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.43 as appropriate.

2. The general test parameter settings are set up according to Table 8.20.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.2.4.3.

5. There are three E-UTRA TDD carriers and three cells specified in the test. Cell 1 is the PCell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 is the inter-frequency neighbour cell, Cell 3 is the SCell. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One TDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	µs	3	Synchronous cells
Cell3 timing offset to cell1	µs	0	Synchronous cells
Time alignment error between cell3 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	10	

8.20.2.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3 The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.2.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to T1 in Table 8.20.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. The SS shall transmit an RRCConnectionReconfiguration message with event A3 configured.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.20.2.5-1.

9. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5

Table 8.20.2.4.3-2: *MeasConfig:* Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
}			

Table 8.20.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.20.2.5 Test requirement

Tables 8.20.2.4.1-1 and 8.20.2.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous inter frequency cells test.

Table 8.20.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
Correlation Matrix and Antenna Configuration		**1x2 Low**		**1x2 Low**		**1x2 Low**	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD		OP.1 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.7	4	4
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-90.3	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.2A E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth

8.20.2A.1 Test purpose

Same test purpose as in clause 8.20.2.1.

8.20.2A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.2A.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.2.3.

8.20.2A.4 Test description

8.20.2A.4.1 Initial conditions

Same initial conditions as in clause 8.20.2.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz.
    - Instead of Table 8.20.2.4.1-1 → use Table 8.20.2A.4.1-1.

Table 8.20.2A.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions for 20 MHz +20 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in clause A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One TDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	20	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	µs	3	Synchronous cells
Cell3 timing offset to cell1	µs	0	Synchronous cells
Time alignment error between cell3 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3			

8.20.2A.4.2 Test procedure

Same test procedure as in clause 8.20.2.4.2 with the following exceptions:

- Instead of Table 8.20.2.5-1 → use Table 8.20.2A.5-1.

8.20.2A.4.3 Message contents

Same message contents as in clause 8.20.2.4.3.

8.20.2A.5 Test requirement

Tables 8.20.2A.4.1-1 and 8.20.2A.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous inter frequency cells test.

Table 8.20.2A.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz + 20 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	20		20		20	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.7 (OP.7 TDD) and in D.2.8 (OP.8)		OP.7 TDD		OP.8 TDD		OP.7 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.7	4	4
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-90.3	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms.

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.2B E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth

8.20.2B.1 Test purpose

Same test purpose as in clause 8.20.2.1.

8.20.2B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

8.20.2B.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.2.3.

8.20.2B.4 Test description

8.20.2B.4.1 Initial conditions

Same initial conditions as in clause 8.20.2.4.1 with the following exceptions:

- Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

- Channel Bandwidth to be tested:The bandwidth combination supported by UE from Table 8.20.2B.5-1 and Annex E table E-3 as defined in 3GPP TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in 3GPP TS 36.521-1 [10] clause 5.4.2A.

- Instead of Table 8.20.2.4.1-1 → use Table 8.20.2B.4.1-1.

Table 8.20.2B.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions for 20 MHz +10 MHz bandwidth

Parameter	Unit	Value	Comment
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 [9] section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
E-UTRA RF Channel Number for SCell		3	One TDD carrier frequencies is used
Channel Bandwidth ($BW_{channel}$)	MHz	20	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Configured active SCell		Cell 3	Cell 3 is on RF channel number 3
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Cell2 timing offset to cell1	µs	3	Synchronous cells
Cell3 timing offset to cell1	µs	0	Synchronous cells
Time alignment error between cell3 and cell1	µs	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	The value of time alignment error depends upon the type of carrier aggregation.
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.			

8.20.2B.4.2 Test procedure

Same test procedure as in clause 8.20.2.4.2 with the following exceptions:

- Instead of Table 8.20.2.5-1 → use Table 8.20.2B.5-1.

8.20.2B.4.3 Message contents

Same message contents as in clause 8.20.2.4.3.

8.20.2B.5 Test requirement

Tables 8.20.2B.4.1-1 and 8.20.2B.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in synchronous inter frequency cells test.

Table 8.20.2B.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	20		10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1) and in D.2.2 (OP.2 TDD) and in D.2.7 (OP.7)		OP.7 TDD		OP.2 TDD		OP.1 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7.7	4	4
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-90.3	-94	-94
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-90.3	-94	-94
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7.7	4	4
Propagation Condition		ETU70					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

8.20.3.1 Test purpose

To verify the UE’s ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements in CA mode.

8.20.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA FDD. Applicability requires support for FGI bit 15.

This test applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA FDD. Applicability requires support for FGI bit 15.

8.20.3.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,

- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{basic\ measurement\ UTRA\_FDD}$ = 6 (cells)

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{\text{basic measurement UTRA\_FDD}}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_FDD}}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify UTRA\_FDD}}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.20.3.

8.20.3.4 Test description

8.20.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.44 as appropriate.

2. The general test parameter settings are set up according to Table 8.20.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.3.4.3.

5. There is one E-UTRA FDD Cell 1 for PCC, one E-UTRA FDD Cell 3 for SCC and one UTRA FDD Cell 2 specified in the test. Cell 1 (E-UTRA FDD cell for PCC) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.3.4.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Configured active SCell		Cell 3	Cell 3 is on E-UTRA RF channel number 2.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.20.3.4.2 Test procedure

The test consists of one active E-UTRA Cell 1 and one UTRA neighbour cell 2 and one configured active SCell Cell 3. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.3.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).

5. Set the parameters according to T1 in Table's 8.20.3.5-1 and 8.20.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

6. SS shall transmit an RRCConnectionReconfiguration message with Event B1 configured.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.20.3.5-1 and 8.20.3.5-2.

9. The UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat steps 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.3.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.20.3.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
measObjectId[2]	IdMeasObject-f2	f2 is the frequency of the configured SCell (E-UTRA Cell)	
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	E-UTRA Cell	
measObjectId[3]	IdMeasObject-f10	f10 is the frequency of the neighbouring cell(UTRA Cell)	
measObject[3]	MeasObjectUTRA-GENERIC(f10)	UTRA Cell	
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f10		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.20.3.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.20.3.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 3	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			

Table 8.20.3.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.20.3.5 Test requirement

Tables 8.20.3.4.1-1, 8.20.3.5-1 and 8.20.3.5-2 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test in CA mode.

Table 8.20.3.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1, cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		**1x2 Low**		**1x2 Low**	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4	4	4	4
$\hat{E}_s/N_{oc}$	dB	4	4	4	4
N_{oc}	dBm/15 kHz	-98		-98	
RSRP	dBm/15 kHz	-94	-94	-94	-94
SCH_RP	dBm/15 kHz	-94	-94	-94	-94
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.20.3.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions

8.20.4.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA TDD cell search requirements in CA mode.

8.20.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.20.4.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify, UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$\mathrm{T}_{\text{measurement UTRA\_TDD}} = Max\left\{\mathrm{T}_{\text{Measurement\_Period UTRA\_TDD}}, \mathrm{T}_{\text{basic measurement UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{\text{basic measurementUTRA\_TDD}}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_TDD.}}$

$X_{\text{basic measurementUTRA\_TDD}} = 6$

$T_{\text{Measurement\_Period UTRA\_TDD}}$ = 480 ms is the period used for calculating the measurement period $T_{\text{measurement\_UTRA\_TDD}}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{\text{basic\_identify\_UTRA\_TDD}}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{\text{basic\_measurement\_UTRA\_TDD}}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify, UTRA\_TDD}}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.20.4.

8.20.4.4 Test description

8.20.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7], Figure group A.44 as appropriate.

2. The general test parameter settings are set up according to Table 8.20.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.20.4.4.3.

5. There is one E-UTRA TDD Cell 1 for PCC, one E-UTRA TDD Cell 3 for SCC and one UTRA TDD Cell 2 specified in the test. Cell 1 (E-UTRA TDD cell for PCC) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.20.4.4.1-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	

8.20.4.4.2 Test procedure

This test scenario comprised of 1 E-UTRA TDD PCell, 1 E-UTRA TDD SCell and 1 UTRA TDD cell to be searched. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure the SCell (Cell 3) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.20.4.4.3.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).

5. Set the parameters according to T1 in Table's 8.20.4.5-1 and 8.20.4.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.

6. SS shall transmit an RRCConnectionReconfiguration message with Event B1 configured.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.20.4.5-1 and 8.20.4.5-2.

9. The UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6402 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

10. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

11. SS shall change to set cell 2 cell parameter id = (current cell 2 cell parameter id +4) mod 16.

12. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.20.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.20.4.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.20.4.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
measObjectId[2]	IdMeasObject-f2	f2 is the frequency of the configured SCell (E-UTRA Cell)	
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	E-UTRA Cell	
measObjectId[3]	IdMeasObject-f9	f9 is the frequency of the neighbouring cell(UTRA Cell)	
measObject[3]	MeasObjectUTRA-GENERIC(f9)	UTRA Cell	
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f9		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.20.4.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	28	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.20.4.4.3-4: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 3	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			

Table 8.20.4.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.20.4.5 Test requirement

Tables 8.20.4.4.1-1, 8.20.4.5-1 and 8.20.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test in CA mode.

Table 8.20.4.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1, cell3)

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD		OP.1 TDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note1	dB				
OCNG_RB Note1	dB				
$\hat{E}_s/I_{ot}$	dB	9	9	9	9
$\hat{E}_s/N_{oc}$	dB	9	9	9	9
N_{oc}	dBm/15kHz	-98			
RSRP	dBm/15kHz	-89	-89	-89	-89
SCH_RP	dBm/15kHz	-89	-89	-89	-89
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.20.4.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5 +
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth

8.20.4A.1 Test purpose

Same test purpose as in clause 8.20.4.1.

8.20.4A.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.20.4A.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.4.3.

8.20.4A.4 Test description

8.20.4A.4.1 Initial conditions

Same initial conditions as in clause 8.20.4.4.1 with the following exceptions:

- Channel Bandwidth to be tested: 20 MHz
- Instead of Table 8.20.4.4.1-1 → use Table 8.20.4A.4.1-1.

Table 8.20.4A.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) cell search in fading propagation conditions for 20 MHz + 20 MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.3 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.10 TDD	As specified in section A.2.2
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3			

8.20.4A.4.2 Test procedure

Same test procedure as in clause 8.20.4.4.2 with the following exceptions:

- Instead of Table 8.20.4.5-1 → use Table 8.20.4A.5-1.
- Instead of Table 8.20.4.5-2 → use Table 8.20.4A.5-2.

8.20.4A.4.3 Message contents

Same message contents as in clause 8.20.4.4.3.

8.20.4A.5 Test requirement

Table 8.20.4A.4.1-1, 8.20.4A.5-1 and 8.20.4A.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test in CA mode.

Table 8.20.4A.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case for 20 MHz + 20 MHz bandwidth (cell 1, cell3)

Parameter	Unit	Cell 1		Cell 3	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	20		20	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Pattern defined in D.2.7 (OP.7 TDD)		OP.7 TDD		OP.7 TDD	
PBCH_RA	dB	0	0	0	0
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note1	dB				
OCNG_RB Note1	dB				
$\hat{E}_s/I_{ot}$	dB	9	9	9	9
$\hat{E}_s/N_{oc}$	dB	9	9	9	9
N_{oc}	dBm/15kHz	-98			
RSRP	dBm/15kHz	-89	-89	-89	-89
SCH_RP	dBm/15kHz	-89	-89	-89	-89
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.20.4A.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth

8.20.4B.1 Test purpose

Same test purpose as in clause 8.20.4.1

8.20.4B.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 15 and 22.

This test applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA and UTRA TDD. Applicability requires support for FGI bits 15 and 39.

8.20.4B.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.20.4.3

8.20.4B.4 Test description

8.20.4B.4.1 Initial conditions

Same initial conditions as in clause 8.20.4.4.1 with the following exceptions:

- Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.
- Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 8.20.4B.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.
- Instead of Table 8.20.4.4.1-1 → use Table 8.20.4B.4.1-1.

Table 8.20.4B.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) cell search in fading propagation conditions for 20 MHz + 10 MHz bandwidth

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA RF Channel Number for SCell		2	One E-UTRA TDD carrier frequency is used.
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Configured active SCell		Cell 3	E-UTRA TDD cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.			

8.20.4B.4.2 Test procedure

Same test procedure as in clause 8.20.4.4.2 with the following exceptions:

- Instead of Table 8.20.4.5-1 → use Table 8.20.4B.5-1.

8.20.4B.4.3 Message contents

Same message contents as in clause 8.20.4.4.3.

8.20.4B.5 Test requirement

Table 8.20.4B.4.1-1, 8.20.4B.5-1 and 8.20.4B.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test in CA mode.

Table 8.20.4B.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case for 20 MHz + 10 MHz bandwidth (cell 1, cell3)

Parameter	Unit	Combination	Cell 1		Cell 3	
			T1	T2	T1	T2
E-UTRA RF Channel Number		All	1		2	
$BW_{channel}$		20MHz+10MHz	20		10	
		10MHz+20MHz	10		20	
Correlation Matrix and Antenna Configuration		All	1x2 Low		1x2 Low	
PDSCH Reference measurement channel defined in A.1.2 (TDD)		20MHz+10MHz	R.3 TDD		R.0 TDD	
		10MHz+20MHz	R.0 TDD		R.3 TDD	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2 (TDD)		20MHz+10MHz	R.10 TDD		R.6 TDD	
		10MHz+20MHz	R.6 TDD		R.10 TDD	
OCNG Pattern defined in D.2 (TDD)		20MHz+10MHz	OP.7 TDD		OP.1 TDD	
		10MHz+20MHz	OP.1 TDD		OP.7 TDD	
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	All	0	0	0	0
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA[Note1]	dB					
OCNG_RB[Note1]	dB					
$\hat{E}_s/I_{ot}$	dB	All	9	9	9	9
$\hat{E}_s/N_{oc}$	dB	All	9	9	9	9
N_{oc}	dBm/15kHz	All	-98			
RSRP	dBm/15kHz	All	-89	-89	-89	-89
SCH_RP	dBm/15kHz	All	-89	-89	-89	-89
Propagation Condition		All	ETU70			
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						

Table 8.20.4B.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify, UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 6402 ms in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.21

8.22 E-UTRAN Discovery Signal Measurements

8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

8.22.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.22.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.1.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra\_SCE\_DRX}$.

$$T_{identify\_intra\_SCE\_DRX} = 16 * Max\ \{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

$T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ is the intra-frequency period for measurements as shown in table 8.22.1.3-1

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ intra\_FDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ as shown in table 8.22.1.3-1, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$.

Table 8.22.1.3-1: Requirement to measure FDD intra frequency cell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_FDD\_CRS\_DRX}$ [ms]
≥ 6	≥1	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }
≥ 25	≥1	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.2.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.1.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.1.1.2 and A.8.22.1.

8.22.1.4 Test description

8.22.1.4.1 Initial conditions

Same Initial conditions as defined in clause 8.1.3.4.1 with the following exceptions:

- Instead of Table 8.1.3.4.1-1 -> use Table 8.22.1.4.1-1.
- Instead of clause 8.1.3.4.3 -> use clause 8.22.1.4.3.

Table 8.22.1.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.1.5-2
T1	s	5	
T2	s	10	

8.22.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.1.5-1 and 8.22.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-3

Table 8.22.1.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.1.4.3-3: MeasObjectEUTRA-GENERIC(f1): Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.22.1.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.22.1.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.1.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.1.4.3-7: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.1.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.22.1.5 Test requirement

Tables 8.22.1.4.1-1, 8.22.1.5-1, 8.22.1.5-2 and 8.22.1.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test.

Table 8.22.1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
$\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
RSRP Note 3	dBm/15 KHz	-91.90	--91.90	-Infinity	-91.90
SCH_RP Note 3	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Io Note 3	dBm/9MHz	-63.17	-60.61	Specified in columns for Cell 1	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		2.3 (CP/2)	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.22.1.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.1.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 4864 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_SCE\_DRX}$

$T_{identify\_intra\_SCE\_DRX} = 16 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX}$

Where $T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

$T_{Measurement\_Period\_intra\_FDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 768\text{ms}$

$T_{identify\_intra\_SCE\_DRX}$ = 4864ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5122 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

8.22.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.22.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra\_SCE\_DRX}$.

$$T_{identify\_intra\_SCE\_DRX} = 16 * \max \{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.1 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ intra\_TDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$ as shown in table 8.22.2.3-1, when DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$

Table 8.22.2.3-1: Requirement to measure TDD intra frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_TDD\_CRS\_DRX}$ [ms]
≥ 6	≥2	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }
≥ 25	≥2	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length }

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2 and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.2.1.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.1.2 and A.8.22.2.

8.22.2.4 Test description

8.22.2.4.1 Initial conditions

Same Initial conditions as defined in clause 8.2.2.4.1 with the following exceptions:

- Instead of Table 8.2.2.4.1-1 -> use Table 8.22.2.4.1-1.
- Instead of clause 8.2.2.4.3 -> use Table 8.22.2.4.3.

Table 8.22.2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211[9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211[9]. The same configuration in both cells
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration	ms	2	As specified in IE MeasDS-Config in TS 36.331[5]
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.2.5-2
T1	s	5	
T2	s	10	

8.22.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.22.2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig-DEFAULT		
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			
}			

Table 8.22.2.4.3-3: MeasObjectEUTRA-GENERIC(f1): Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.22.2.4.3-4: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

Table 8.22.2.4.3-5: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.2.4.3-6: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.2.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.22.2.5 Test requirement

Tables 8.22.2.5-1, 8.22.2.5-2 and 8.22.2.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal test.

Table 8.22.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 KHz	-98+TT			
$\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
$\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
RSRP Note 3	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
SCH_RP Note 3	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
Io Note 3	dBm/9MHz	-62.76	-60.16	Specified in columns for Cell 1	
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		2.3 (CP/2)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.2.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.2.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 4864ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_SCE\_DRX}$

$T_{identify\_intra\_SCE\_DRX} = 16 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length}\} + T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX}$

Where $T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms

$T_{Measurement\_Period\_intra\_TDD\_CRS\_DRX} = 3 * Max\{ T_{DMTC\_periodicity}, \text{DRX cycle length} \} = 768\text{ms}$

$T_{identify\_intra\_SCE\_DRX}$ = 4864ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5122 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

8.22.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.22.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and forward and supports CRS based discovery signals measurement. Applicability requires support for FGIs bits 5 and 25.

8.22.3.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided. The discovery signal occasion and the measurement gap should be aligned, provided that also the following additional conditions are fulfilled:

- Entire discovery signal occasion should be contained in the measurement gap.
- The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter\_SCE\_DRX}$.

$$T_{identify\_inter\_SCE\ DRX} = 17 * Max\ \{ T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\} *N_{freq} + T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Clause 9.1.14.4 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

$T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ is the inter-frequency period for measurements as shown in Table 8.22.3.3-1. N_{freq} is defined in clause TS 36.133 [4] 8.1.2.1.1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.22.3.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.3.3-1: Requirement to measure FDD inter frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_FDD\_CRS\_DRX}$ [ms]
≥6	≥1	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}
≥25	≥1	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2, and 9.1.14.4 respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_SCE\ DRX}$ defined in TS 36.133 [4] Clause 8.6.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_SCE\ DRX}$ defined in TS 36.133 [4] clause 8.6.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.2.1 and A.8.22.3.

8.22.3.4 Test description

8.22.3.4.1 Initial conditions

Same Initial conditions as defined in clause 8.3.2.4.1 with the following exceptions:

- Instead of Table 8.3.2.4.1-1 -> use Table 8.22.3.4.1-1.
- Instead of clause 8.3.2.4.3 -> use Table 8.22.3.4.3.

Table 8.22.3.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 [4] clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 [5] clause 6.3.5
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331 [5]
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331 [5]
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331 [5]
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211[9]
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table 8.22.3.5-2
T1	s	5	
T2	s	10	

8.22.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.22.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.3.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5378 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 with Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.3.4.3-3: MeasObjectEUTRA-GENERIC(Freq): Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.22.3.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.22.3.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.3.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.3.4.3-7: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.3.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.22.3.4.3-9: *PRACH-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.22.3.5 Test requirement

Tables 8.22.3.4.1-1, 8.22.3.5-1, 8.22.3.5-2 and 8.22.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test.

Table 8.22.3.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 3	dBm/9MHz	-64.76	-64.76	-70.22	-62.43
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		3	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.22.3.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.3.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

- Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length
- Measurement reporting delay = $T_{identify\_inter\_SCE\_DRX.}$

$T_{identify\_inter\_SCE\ DRX}$ = 17 * *Max* { $T_{DMTC\_periodicity}$, DRX cycle length, MGRP} *N_{freq} +$T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$

Where $T_{DMTC\_periodicity}$ = 160ms,

- DRX cycle length = 256ms.
- $T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$ = 3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq} = 768ms

  Where N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

  Gap Pattern Id = 0, MGRP = 40ms

$T_{identify\_inter\_SCE\ DRX}$ = 5120 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5378 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

8.22.4.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements.

8.22.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bits 5, and 25.

8.22.4.3 Minimum conformance requirements

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter\_SCE\_DRX}$.

$$T_{identify\_inter\_SCE\_DRX} = 17 * Max\ \{ T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\} *N_{freq} + T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$$

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Clause 9.1.14.2 and RSRQ related side conditions given in TS 36.133 [4] Sections 9.1.14.4 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.3 for a corresponding Band

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

$T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$ is the inter-frequency period for measurements as shown in Table 8.22.4.3-1. N_{freq} is defined in TS 36.133 [4] clause 8.1.2.1.1.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ intra\_TDD\_CRS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional cell identification delay can be expected.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 3 identified inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.22.4.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.4.3-1: Requirement to measure TDD inter frequency cell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_TDD\_CRS\_DRX}$ [ms]
≥6	≥2	5 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}
≥25	≥2	3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq}

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clauses 9.1.14.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.14.4.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.2, and 9.1.14.4, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.2.2.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$ defined in TS 36.133 [4] clause 8.6.2.2.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.2.2.2 and A.8.22.4.

8.22.4.4 Test description

8.22.4.4.1 Initial conditions

Same Initial conditions as defined in clause 8.4.2.4.1 with the following exceptions:

- Instead of Table 8.4.2.4.1-1 -> use Table 8.22.4.4.1-1.
- Instead of clause 8.4.2.4.3 -> use Table 8.22.4.4.3.

Table 8.22.4.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1，2	Two TDD carrier frequencies are used.
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 clause 8.1.2.1.
Gap Offset		9	As specified in TS 36.331 clause 6.3.5
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
DMTC period	ms	160	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	2	As specified in IE MeasDS-Config in TS 36.331
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table A.8.22.4.1-3
T1	s	5	
T2	s	10	

8.22.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CRS based discovery signals measurement and event-triggered reporting with Event A3 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and The SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5378 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.4.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.1-9 with the Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.4.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated- HO		
}			
}			
}			
}			

Table 8.22.4.4.3-3: MeasObjectEUTRA-GENERIC(Freq): Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	25		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	2		
}			
}			
}			
}			

Table 8.22.4.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.22.4.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.4.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.4.4.3-7: *MeasResults:* Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.22.4.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.22.4.4.3-9: *PRACH-Config-DEFAULT*: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test requirement

Derivation Path: TS 36.508 [7] clause 7.3.2 Table 7.3.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	4		
}			

8.22.4.5 Test requirement

Tables 8.22.4.5-1, 8.22.4.5-2 and 8.22.4.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal test.

Table 8.22.4.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
Io Note 3	dBm/9MHz	-64.76	-64.76	-70.22	-62.43
Propagation Condition		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-		3 (Synchronous cells)	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.22.4.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.4.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 5120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delay measured test requirement is expressed as:

- Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length
- Measurement reporting delay = $T_{identify\_inter\_SCE\_DRX.}$

$T_{identify\_inter\_SCE\ DRX}$ = 17 * *Max* { $T_{DMTC\_periodicity}$, DRX cycle length, MGRP} *N_{freq} +$T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$

Where:

- $T_{DMTC\_periodicity}$ = 160ms,
- DRX cycle length = 256ms.
- $T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$ = 3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length,MGRP}*N_{freq} = 768ms
  - Where N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.
  - Gap Pattern Id = 0, MGRP = 40ms
- $T_{identify\_inter\_SCE\ DRX}$ = 5120 ms.
- TTI insertion uncertainty = 2 ms
- DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5378 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

8.22.5.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event in DRX. The test will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in TS 36.133 [4] clause 8.6.3.1.1.2.

8.22.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.5.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency TP within $T_{identify\_intra\_TP\_SCE\_DRX}$.

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.10 for a corresponding Band.

$T_{identify\_intra\_SCE\_DRX}$ is the intra-frequency period for cell identification in TS 36.133 [4] section 8.6.2.1.1.2. $T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$ is the intra-frequency period for TP measurement as shown in table 8.22.5.3-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_intra\_FDD\_CSI-RS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$ as shown in table 8.22.5.3-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$.

Table 8.22.5.3-1: Requirement to measure FDD intra frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_FDD\_CSI-RS\_DRX}$ [ms]
≥ 6	≥1	5**Max*{$T_{DMTC\_periodicity}$, DRX cycle length}
≥ 25	≥1	3**Max*{$T_{DMTC\_periodicity}$, DRX cycle length}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.3.1.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.3.1.1.2 becomes undetectable for a period $\leq$ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.1.1.2 and A.8.22.5.

8.22.5.4 Test description

8.22.5.4.1 Initial conditions

Same initial conditions as defined in clause 8.1.3.4.1 with the following exceptions:

- Instead of Table 8.1.3.4.1-1 -> use Table 8.22.5.4.1-1.
- Instead of clause 8.1.3.4.3 -> use clause 8.22.5.4.3.

Table 8.22.5.4.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion duration	ms	1	
c2-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.5.5-2
Time offset between cells		2.3 μs	CP/2 or Synchronous cells
T1	s	5	
T2	s	10	

8.22.5.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C2 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.5.5-1 and 8.22.5.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event C2. If the overall delays measured from the beginning of time period T2 is less than 5890ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.5.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.7-3

Table 8.22.5.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.5.4.3-3: *MeasObjectEUTRA-GENERIC(f1)*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.5.4.3-4: *QuantityConfig-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.5.4.3-5: *ReportConfigEUTRA-C2*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-11: ReportConfigEUTRA-C2			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C2 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC2-r12 SEQUENCE {			
c2-RefCSI-RS-r12	1		
c2-Offset-r12	-12 (-6dB)	-6 is actual value in dB (-12*0.5 dB)	
c2-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.5.4.3-5: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.5.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.5.4.3-7: *MeasResults*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 8.22.5.4.3-8: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.22.5.5 Test requirement

Tables 8.22.5.4.1-1, 8.22.5.5-1, 8.22.5.5-2 and 8.22.5.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal test.

Table 8.22.5.5-1: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD as in A.1.1		DL Reference Measurement Channel R.0 FDD as in A.1.1	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD as in A.2.1		DL Reference Measurement Channel R.6 FDD as in A.2.1	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	-6	-6	-6	-6
N_{oc} Note 3	dBm/15 KHz	-98			
CRS $\hat{E}_s/N_{oc}$	dB	6.10	6.10	-Infinity	6.10
CSI-RS $\hat{E}_s/N_{oc}$	dB	12.10	12.10	-Infinity	12.10
CRS $\hat{E}_s/I_{ot}$	dB	6.10	-0.95	-Infinity	-0.95
CSI-RS $\hat{E}_s/I_{ot}$	dB	12.10	5.05	-Infinity	5.05
RSRP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
CSI-RSRP Note 4	dBm/15 KHz	-85.90	-85.90	-Infinity	-85.90
SCH_RP Note 4	dBm/15 KHz	-91.90	-91.90	-Infinity	-91.90
Io	dBm/9 MHz	-63.17	-60.61	Specified in columns for cell1	
CSI reference signal configurations [9]		2		4	
CSI-RS periodicity	ms	10		10	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Propagation Condition		ETU30		ETU30	
Timing offset to cell 1	us	-		2.3 (CP/2)	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.5.5-2: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in DRX based on CSI-RS based discovery signal

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.5.5-3: *TimeAlignmentTimer* and sr-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE shall send one Event C2 triggered measurement report, with a measurement reporting delay less than 5890ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C2 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_TP\_SCE\_DRX}$

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$

Where

$T_{identify\_intra\_SCE\_DRX\ =}$ 16* *Max* { $T_{DMTC\_periodicity}$, DRX cycle length}+ $T_{Measurement\_Period\ \_intra\_FDD\_CRS\_DRX,}$

$T_{Measurement\_Period\ \_intra\_FDD\_CRS\_DRX}$ = 3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length },

$T_{Measurement\_Period\ \_intra\_FDD\_CSI-RS\_DRX}$ = 3 * *Max*{ $T_{DMTC\_periodicity}$, DRX cycle length } = 768ms,

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

$T_{identify\_intra\_TP\_SCE\_DRX}$ = 22* *Max* { $T_{DMTC\_periodicity}$, DRX cycle length} = 5632ms

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5890ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

8.22.6.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX based on CSI-RS based discovery signal under fading propagation conditions within the E-UTRA TDD-TDD intra frequency cell search requirements.

8.22.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 5.

8.22.6.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency TP within $T_{identify\_intra\_TP\_SCE\_DRX}$.

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_TDD\_CSI-RS\_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.10 for a corresponding Band

$T_{identify\_intra\_SCE\_DRX}$ is the intra-frequency period for cell identification as shown in section 8.22.2.3. $T_{Measurement\_Period\_intra\_TDD\_CSI-RS\_DRX}$ is the intra-frequency period for TP measurement as shown in Table 8.22.6.3-1.

Identification of a TP shall include identification of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\_intra\_TDD\_CSI-RS\_DRX}$ when DRX is used. If higher layer filtering is used, an additional TP identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{Measurement\_Period\ \_intra\_TDD\_CSI-RS\_DRX}$ as shown in table 8.22.6.3-1, when DRX is in use. The UE shall be capable of performing CSI-RSRP measurements for 3 identified intra-frequency TPs, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_Period\ \_intra\_TDD\_CSI-RS\_DRX}$.

Table 8.22.6.3-1: Requirement to measure TDD intrafrequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ intra\_TDD\_CSI-RS\_DRX}$ [ms]
≥ 6	≥2	5**Max*{$T_{DMTC\_periodicity}$, DRX cycle length}
≥ 25	≥2	3**Max*{$T_{DMTC\_periodicity}$, DRX cycle length}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.3.1.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_intra\_TP\_SCE\_DRX}$ defined in clause TS 36.133 [4] 8.6.3.1.2.2 becomes undetectable for a period ≤ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ \_intra\_TDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.1.2.2 and A.8.22.6.

8.22.6.4 Test description

8.22.6.4.1 Initial conditions

Same Initial conditions as defined in clause 8.2.2.4.1 with the following exceptions:

- Instead of Table 8.2.2.4.1-1 -> use Table 8.22.6.4.1-1.
- Instead of clause 8.2.2.4.3 -> use clause 8.22.6.4.3.

Table 8.22.6.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
DMTC period [5]	ms	160	
DMTC period offset [5]	ms	10	
Discovery signal occasion duration	ms	2	
c2-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211 [9]. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211 [9]. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.6.5-2
T1	s	5	
T2	s	10	

8.22.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C2 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.6.5-1 and 8.22.6.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event C2. If the overall delays measured from the beginning of time period T2 is less than 5890ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions for DRS measurement based on CSI-RS with DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.7-3

Table 8.22.6.4.3-2: *RRCConnectionReconfiguration*

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.6.4.3-3: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.6.4.3-4: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.6.4.3-5: *ReportConfigEUTRA-C2*

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-11: ReportConfigEUTRA-C2			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C2 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC2-r12 SEQUENCE {			
c2-RefCSI-RS-r12	1		
c2-Offset-r12	-12 (-6dB)	-6 is actual value in dB (-12*0.5 dB)	
c2-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.6.4.3-6: *MAC-MainConfig-RBCs*

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.6.4.3-6: *SchedulingRequest-Config-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.6.4.3-7: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
measResultCSI-RS-List-r12	MeasResultCSI-RS-List-r12		
}			
}			

Table 8.22.6.4.3-8: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.22.6.4.3-9: *MeasResultCSI-RS-List-r12*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultCSI-RS-List-r12 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			

8.22.6.5 Test requirement

Tables 8.22.6.4.1-1, 8.22.6.5-1, 8.22.6.5-2 and 8.22.6.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CSI-RS based discovery signal test.

Table 8.22.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD as in A.1.2		DL Reference Measurement Channel R.0 TDD as in A.1.2	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD as in A.2.2		DL Reference Measurement Channel R.6 TDD as in A.2.2	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	-6	-6	-6	-6
N_{oc} Note 3	dBm/15 KHz	-98			
CRS $\hat{E}_s/N_{oc}$	dB	6.60	6.60	-Infinity	6.60
CSI-RS $\hat{E}_s/N_{oc}$	dB	12.60	12.60	-Infinity	12.60
CRS $\hat{E}_s/I_{ot}$	dB	6.60	-0.86	-Infinity	-0.86
CSI-RS $\hat{E}_s/I_{ot}$	dB	12.60	5.14	-Infinity	5.14
RSRP Note 4	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
CSI-RSRP Note 4	dBm/15 KHz	-85.40	-85.40	-Infinity	-85.40
Io	dBm/9 MHz	-62.76	-60.16	Specified in columns for cell1	
SCH_RP Note 4	dBm/15 KHz	-91.40	-91.40	-Infinity	-91.40
Propagation Condition		ETU30			
CSI reference signal configurations [9]		2		4	
CSI-RS periodicity	ms	10		10	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Timing offset to cell 1	us	0		2.3 (CP/2)	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.6.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 8.22.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331 [5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5] and section10.1 in TS 36.213 [8].

The UE shall send one Event C2 triggered measurement report, with a measurement reporting delay less than 5632 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C2 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra\_TP\_SCE\_DRX}$

$T_{identify\_intra\_TP\_SCE\_DRX} = T_{identify\_intra\_SCE\_DRX} + T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX}$

Where $T_{identify\_intra\_SCE\_DRX\ =}$ $16* Max\ \{T_{DMTC\_periodicity}$, DRX cycle length$\}+ T_{Measurement_Period\ _intra_TDD_CRS_DRX}$

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

$T_{Measurement\_Period\ \_intra\_TDD\_CRS\_DRX} = 3 *\ Max\{\ T_{DMTC\_periodicity}$, DRX cycle length } = 768ms

$T_{Measurement\_Period\ \_intra\_TDD\_CSI\text{-}RS\_DRX} = 3 *\ Max\{\ T_{DMTC\_periodicity}$, DRX cycle length } = 768ms

$T_{identify\_intra\_SCE\_DRX}\ =\ 19 *\ Max\{\ T_{DMTC\_periodicity}$, DRX cycle length } = 4864 ms.

$T_{identify\_intra\_TP\_SCE\_DRX}\ =\ 22 *\ Max\{\ T_{DMTC\_periodicity}$, DRX cycle length } = 5632 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 5890 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.7 E-UTRAN FDD-FDD Inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

8.22.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX under fading propagation conditions within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.22.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGIs bits 5 and 25.

8.22.7.3 Minimum conformance requirements

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency TP within $T_{identify\_inter\_TP\_SCE\_DRX}$ according to the following expression:

$T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$

A TP shall be considered detectable when

- CSI-RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.11 for a corresponding Band.

$T_{identify\_inter\_SCE\_DRX}$ is the inter-frequency period for cell identification as shown in TS 36.133 [4] section 8.6.2.2.1.2. N_{freq} is defined in TS 36.133 [4] clause 8.1.2.1.1. $T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$ is the inter-frequency period for TP measurement as shown in table 8.22.7.3-1.

When measurement gaps are scheduled for FDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.14.3, with measurement period given by table 8.22.7.3-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.22.7.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.7.3-1: Requirement to measure FDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_FDD\_CSI-RS\_DRX}$ [ms]
≥ 6	≥1	5*Max{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP}*N_{freq}
≥ 25	≥1	3*Max{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP}*N_{freq}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.3.2.1.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_inter\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] clause 8.6.3.2.1.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.2.1.2 and A.8.22.7.

8.22.7.4 Test description

8.22.7.4.1 Initial conditions

Same Initial conditions as defined in clause 8.3.2.4.1 with the following exceptions:

- Instead of Table 8.3.2.4.1-1 -> use Table 8.22.7.4.1-1.
- Instead of clause 8.3.2.4.3 -> use Table 8.22.7.4.3.

Table 8.22.7.4.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Value	Comment
		Test 1	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1,2	Two FDD carrier frequency is used.
DMTC period [2]	ms	160	
DMTC period offset [2]	ms	10	
Discovery signal occasion duration	ms	1	
C1-Threshold	dB	-93	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table 8.22.7.5-2
T1	s	5	
T2	s	10	

8.22.7.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C1 is configured. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Time Alignment Timer to keep the UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.7.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and the SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Time Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.7.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 6146 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.7.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-9 with Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.7.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.7.4.3-3: MeasObjectEUTRA-GENERIC(Freq): Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.5.4.3-4: *QuantityConfig-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.7.4.3-5: *ReportConfigEUTRA-C1*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirement

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-10: ReportConfigEUTRA-C1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC1-r12 SEQUENCE {			
c1-Threshold-r12	47 (Thres+140)	Thres is actual threshold value in dBm	
c1-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.7.4.3-6: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.7.4.3-7: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.7.4.3-8: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 8.22.7.4.3-9: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.22.7.5 Test requirement

Tables 8.22.7.4.1-1, 8.22.7.5-1, 8.22.7.5-2 and 8.22.7.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX test.

Table 8.22.7.5-1: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD as in A.1.1		DL Reference Measurement Channel R.0 FDD as in A.1.1	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD as in A.2.1		DL Reference Measurement Channel R.6 FDD as in A.2.1	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	6	6	6	6
N_{oc} Note 3	dBm/15 KHz	-98+TT			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
CRS $\hat{E}_s/I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
CSI-RS $\hat{E}_s/I_{ot}$	dB	10+TT	4.54+TT	-Infinity	4.54+TT
RSRP Note 4	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
CSI-RSRP Note 4	dBm/15 KHz	-88+TT	-88+TT	-Infinity	-88+TT
SCH_RP Note 4	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
Io	dBm/9 MHz	-60+TT	-60+TT	As specified for cell 1	
Propagation Condition		ETU30			
CSI reference signal configurations [9]		2		4	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Timing offset to cell 1	us	-		3us	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.22.7.5-2: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331[5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf256	
shortDRX	disable	

Table 8.22.7.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331[5] and section10.1 in TS 36.213[8].

The UE shall send one Event C1 triggered measurement report, with a measurement reporting delay less than 6146ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C1 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX}$

$T_{identify\_inter\_SCE\ DRX} = 17 * Max\ \{ T_{DMTC\_periodicity}$, DRX cycle length, MGRP} $*N_{freq} + T_{Measurement\_Period\_inter\_FDD\_CRS\_DRX}$

$T_{Measurement\_Period\_inter\_FDD\_CSI-RS\_DRX} = 3*Max\{T_{DMTC\_periodicity}$, DRX cycle length, MGRP}$*N_{freq}$

$T_{identify\_inter\_TP\_SCE\_DRX} = 23*Max\{T_{DMTC\_periodicity}$, DRX cycle length, MGRP}$*N_{freq}$

Where:

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

Where N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

Gap Pattern Id = 0, MGRP = 40ms

$T_{identify\_inter\_TP\_SCE\_DRX}$ = 5888 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 6146 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

8.22.8.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when discovery signal is configured in DRX based on CSI-RS based discovery signal under fading propagation conditions within the E-UTRA TDD-TDD inter-frequency cell search requirements.

8.22.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 5 and 25.

8.22.8.3 Minimum conformance requirements

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency TP within $T_{identify\_inter\_TP\_SCE\_DRX}$ according to the following expression:

$T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\ \_inter\_TDD\_CSI-RS\_DRX}$

A TP shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] Sections 9.1.14.3 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to Annex I.2.11 for a corresponding Band.

$T_{identify\_inter\_SCE\_DRX}$ is the inter-frequency period for cell identification as shown in TS 36.133 [4] section 8.6.2.2.2.2. N_{freq} is defined in TS 36.133 [4] clause 8.1.2.1.1. $T_{Measurement\_Period\ \_inter\_TDD\_CSI-RS\_DRX}$ is the inter-frequency period for TP measurement as shown in table 8.22.8.3-1.

When measurement gaps are scheduled for TDD inter frequency measurements, or the UE supports capability of conducting such measurements without gaps, the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] sub-clauses 9.1.14.3, with measurement period given by table 8.22.8.3-1.

The UE shall be capable of performing CSI-RSRP measurements of at least 3 identified inter-frequency TPs per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting CSI-RSRP measurements to higher layers with the measurement period defined in table 8.22.8.3-1 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.22.8.3-1: Requirement to measure TDD inter frequency TP

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{Measurement\_Period\ inter\_TDD\_CSI-RS\_DRX}$ [ms]
≥ 6	≥2	5*Max\{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP\}*N_{freq}
≥ 25	≥2	3*Max\{$T_{DMTC\_periodicity}$, DRX cycle length, MGRP\}*N_{freq}

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer.

The CSI-RSRP measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clauses 9.1.14.3.

Reported CSI-RSRP measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] sections 9.1.14.3.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter\_TP\_SCE\_DRX}$ defined in TS 36.133 [4] Clause 8.6.3.2.2.2. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_inter\_TP\_SCE\_DRX}$ in TS 36.133 [4] clause 8.6.3.2.2.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ \_inter\_TDD\_CSI-RS\_DRX}$ provided the timing to that TP has not changed more than $\pm$ 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.6.3.2.2.2 and A.8.22.8.

8.22.8.4 Test description

8.22.8.4.1 Initial conditions

Same Initial conditions as defined in clause 8.4.2.4.1 with the following exceptions:

- Instead of Table 8.4.2.4.1-1 -> use Table 8.22.8.4.1-1.
- Instead of clause 8.4.2.4.3 -> use clause 8.22.8.4.3.

Table 8.22.8.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Test 1	Comment
		Value	

E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133[4] clause 8.1.2.1.
Uplink-downlink configuration		1	As specified in TS 36.211[9] clause 4.2 Table 4.2-2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211[9]. The same configuration in both cells
DMTC period [5]	ms	160	
DMTC period offset [5]	ms	10	
Discovery signal occasion duration	ms	2	
C1-Threshold	dB	-93	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
PRACH configuration		4	As specified in table 5.7.1-3 in TS 36.211[9]
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DRX		ON	DRX related parameters are defined in Table 8.22.8.5-2
T1	s	5	
T2	s	10	

8.22.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information, it is indicated to the UE performing CSI-RS based discovery signals measurement and event-triggered reporting with Event C1 is configured. Entire discovery signal occasion should be contained in the measurement gap. The subframe contained discovery signal for the measurement is not overlapped with the first 0.5ms period and the last 0.5ms period in every gap. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to T1 in Table 8.22.8.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message and The SS shall provide the UE with new Timing Advance Command MAC control element at least once every 500 ms to restart the Timer Alignment Timer in order to keep the UE uplink time alignment.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.8.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event C1. If the overall delays measured from the beginning of time period T2 is less than 6146 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.22.8.4.3 Message contents

Table 8.22.8.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions for DRS measurement based on CSI-RS with DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-9 with the Gap Pattern Id = 0 Table H.3.7-3

Table 8.22.8.4.3-2: *RRCConnectionReconfiguration*

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.22.8.4.3-3: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
}			
}			
}			
}			

Table 8.22.8.4.3-4: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

Table 8.22.8.4.3-5: *ReportConfigEUTRA-C1*

Derivation Path: 36.508 clause 4.6.6, Table 4.6.6-10: ReportConfigEUTRA-C1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-C1 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventC1-r12 SEQUENCE {			
c1-Threshold-r12	47 (Thres+140)	Thres is actual threshold value in dBm	
c1-ReportOnLeave-r12	FALSE		
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0 (0 ms)		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportStrongestCSI-RSs-r12	false		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

Table 8.22.8.4.3-6: *MAC-MainConfig-RBC*s

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {			
sf256	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

Table 8.22.8.4.3-6: *SchedulingRequest-Config-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.22.8.4.3-7: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
measResultCSI-RS-List-r12	MeasResultCSI-RS-List-r12		
}			
}			

Table 8.22.8.4.3-8: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.22.8.4.3-9: *MeasResultCSI-RS-List-r12*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultCSI-RS-List-r12 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			

8.22.8.5 Test requirement

Tables 8.22.8.4.1-1, 8.22.8.5-1, 8.22.8.5-2 and 8.22.8.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CSI-RS based discovery signal test.

Table 8.22.8.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2

E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
Measurement bandwidth	n_{PRB}	13-37		13-37	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD as in A.1.2		DL Reference Measurement Channel R.0 TDD as in A.1.2	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD as in A.2.2		DL Reference Measurement Channel R.6 TDD as in A.2.2	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
p-C-r10 [5]	dB	6+TT	6+TT	6+TT	6+TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	4+TT
CRS $\hat{E}_s/I_{ot}$	dB	4+TT	-1.46+TT	-Infinity	-1.46+TT
CSI-RS $\hat{E}_s/I_{ot}$	dB	10+TT	4.54+TT	-Infinity	4.54+TT
RSRP Note 4	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
CSI-RSRP Note 4	dBm/15 KHz	-88+TT	-88+TT	-Infinity	-88+TT
SCH_RP Note 4	dBm/15 KHz	-94+TT	-94+TT	-Infinity	-94+TT
Io	dBm/9 MHz	-60+TT	-60+TT	As specified for cell1	
Propagation Condition		ETU30			
CSI reference signal configurations [9]		2		4	
CSI-RS subframe offset		0		0	
CSI-RS individual offset [5]	dB	0		0	
CSI-RS muting		Enable		Enable	
Timing offset to cell 1	us	-		3	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.22.8.5-2: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
onDurationTimer	psf1	As specified in clause 6.3.2 in TS 36.331 [5]
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	Sf256	
shortDRX	disable	

Table 8.22.8.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in clause 6.3.2 in TS 36.331[5]
sr-ConfigIndex	0	For further information see clause 6.3.2 in TS 36.331 [5]and section10.1 in TS 36.213 [8].

The UE shall send one Event C1 triggered measurement report, with a measurement reporting delay less than 5888 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event C1 measurement report.

The overall delay measured test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter\_TP\_SCE\_DRX}$

$T_{identify\_inter\_TP\_SCE\_DRX} = T_{identify\_inter\_SCE\_DRX} + T_{Measurement\_Period\ \_inter\_TDD\_CSI-RS\_DRX}$

Where $T_{identify\_inter\_SCE\_DRX} = 17 * Max\ \{T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\} *N_{freq} + T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX}$

$T_{DMTC\_periodicity}$ = 160ms,

DRX cycle length = 256ms.

MGRP = 40ms,

N_{freq} = 1,

$T_{Measurement\_Period\_inter\_TDD\_CRS\_DRX} = 3 * Max\ \{T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\}$

$T_{Measurement\_Period\ \_inter\_TDD\_CSI-RS\_DRX} = 3 * Max\ \{T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\}$

$T_{identify\_inter\_SCE\_DRX} = 20 * Max\ \{T_{DMTC\_periodicity}, \text{DRX cycle length, MGRP}\}$

$T_{identify\_intra\_TP\_SCE\_DRX}$ = 23 * *Max* { $T_{DMTC\_periodicity}$, DRX cycle length, MGRP} = 5888 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 256 ms

The overall delay measured shall be less than a total of 6146 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

8.22.9.1 Test purpose

The purpose of this test is to verify that the UE correctly detects events A2 (Serving cell becomes worse than threshold) and A6 (Neighbour becomes better than SCell) defined in TS 36.331 [6] when CRS based discovery signal is configured within the requirements stated in TS36.133 [4] clause 8.7.2.4.1.

8.22.9.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 12 and forward that support [CA and CRS based discovery signals measurement]. Applicability requires support for FGI bit 111.

8.22.9.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc\_SCE}$, according to the parameter *measCycleSCell* where $T_{identify\_scc\_CRS}$ = 13 **measCycleSCell*+ $T_{measure\_scc\_CRS}$

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Clause 9.1.15 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.10 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CRS}$ according to the parameter *measCycleSCell* shown in Tables 8.22.9.3-1 and 8.22.9.3-2.

Table 8.22.9.3-1: Requirement to measure intra frequency cell on FDD SCC with deactivated SCell

Measurement bandwidth[RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CRS}$ [ms]
≥ 6	≥1	5* *measCycleSCell*
≥ 25	≥1	3 * *measCycleSCell*

Table 8.22.9.3-2: Requirement to measure intra frequency cell on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CRS}$ [ms]
≥ 6	≥2	5* *measCycleSCell*
≥ 25	≥2	3 * *measCycleSCell*

The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc\_CRS}$.

The measurement accuracy for all measured cells shall be as specified in the TS 36.133 [4] sub-clause 9.1.15.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_CRS}$ defined in TS 36.133 [4] Clause 8.7.2.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc\_SCE}$ defined in TS 36.133 [4] clause 8.7.2.4.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc\_CRS}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.2.4.1 and A.8.22.9.

8.22.9.4 Test description

8.22.9.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 -> use Table 8.22.9.4.1-1.
- Instead of clause 8.16.1.4.3 -> use clause 8.22.9.4.3.

Table 8.22.9.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.14.2 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.14.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	10	
T2		s	10	
T3		s	5	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.9.4.2 Test procedure

It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.22.9.4.3.

4. Set the parameters according to T1 in Table 8.22.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.9.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 5122ms, then count a success for the event "A6". Otherwise count a fail for the event "A6".

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.22.9.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 482ms, then count a success for the event "Cell 1 A2". If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 1 A2" is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 962ms, then count a success for the event "Cell 2 A2". If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event "Cell 2 A2" is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events "A6", "Cell 1 A2" and "Cell 2 A2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.22.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.9.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.22.9.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.9.4.3-3: RadioResourceConfigCommonSCell-r10

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.9.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.22.1.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.16.2.4.3-6: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.9.4.3-7: *ReportConfig-A2-H*

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.22.9.4.3-8: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.22.9.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.22.9.5 Test requirement

Table 8.22.9.4-1 and Table 8.22.9.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CRS based discovery signal.

Table 8.22.9.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters: DL Reference Measurement Channel		R.0 FDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	-0.15	-4.96	-infinity	-0.25	-4.70
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
Io Note 3	dBm/9MHz	-53.97	-53.97	-71.45	-53.97	-51.08	-70.25	Specified in columns for Cell 2		
Propagation Condition		ETU30			ETU30			ETU30		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			-		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		
Timing offset to Cell 2	µs	-			-			2.3 (CP/2)		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_SCE}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc\_SCE}$

$T_{identify\_scc\_CRS}$ = 13 **measCycleSCell*+ $T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS}$ = 3 * *measCycleSCell*

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS}$ = 16 **measCycleSCell* = 5120 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 5122 ms from the beginning of time T2 (note: this gives a total of 5120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.6.2.1 in which $T_{Measurement\_Period\ intra\_FDD\_CRS}$ = 3 * $T_{DMTC\_periodicity}$ = 480ms.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CRS}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc\_CRS}$

where $T_{measure\_scc\_CRS}$ = 3 * *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T3 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 and A2 are passed, otherwise fail the UE.

8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

8.22.10.1 Test purpose

Same test purpose as in clause 8.22.9.1.

8.22.10.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 12 and forward that support [CA and CRS based discovery signals measurement]. Applicability requires support for FGI bit 111.

8.22.10.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.22.9.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.2.4.1 and A.8.22.10.

8.22.10.4 Test description

8.22.10.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 -> use Table 8.22.10.4.1-1.
- Instead of clause 8.16.2.4.3 -> use clause 8.22.10.4.3.

Table 8.22.10.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211[9]. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331 [5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331 [5]
Discovery signal occasion duration		ms	2	As specified in IE MeasDS-Config in TS 36.331 [5]
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in clause 9.1.14.2 into account plus margin.
	Time To Trigger	s	0	
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-6	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in TS 36.133 [4] clause 9.1.14.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	10	
T2		s	10	
T3		s	5	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.10.4.2 Test procedure

Same test procedure as in clause 8.22.9.4.2 with the following exceptions:

- Instead of clause 8.22.9.4.3 for message content exceptions → use clause 8.22.10.4.3.
- Instead of Table 8.22.9.5-1 → use Table 8.22.10.5-1.

8.22.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.10.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.22.10.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.10.4.3-3: *RadioResourceConfigCommonSCell-r10*

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.10.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.22.1.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.16.2.4.3-6: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.10.4.3-7: *ReportConfig-A2-H*

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.22.10.4.3-8: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.22.10.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

8.22.10.5 Test requirement

Table 8.22.10.4-1 and Table 8.22.10.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CRS based discovery signal.

Table 8.22.10.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters: DL Reference Measurement Channel		R.0 TDD			-			-		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101.00			-101.00					
$\hat{E}_s/N_{oc}$	dB	19.20	19.20	-3.00	19.20	19.20	-3.20	-infinity	19.00	-3.00
$\hat{E}_s/I_{ot}$	dB	19.20	19.20	-3.00	19.20	-0.15	-4.96	-infinity	-0.25	-4.70
RSRP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
SCH_RP Note 3	dBm/15 kHz	-81.80	-81.80	-104.00	-81.80	-81.80	-104.20	-infinity	-82.00	-104.00
Io Note 3	dBm/9MHz	-53.97	-53.97+TT	-71.45	-53.97	-51.08	-70.25	Specified in columns for Cell 2		
Propagation Condition		ETU30			ETU30			ETU30		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
Timing offset to Cell 1	µs	-			0			-		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE			N/A		
Timing offset to Cell 2	µs	-			-			2.3 (CP/2)		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_SCE}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_scc\_SCE}$

$T_{identify\_scc\_CRS}$ = 13 *$measCycleSCell$+ $T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS}$ = 3 * $measCycleSCell$

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS}$ = 16 *$measCycleSCell$ = 5120 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 5122 ms from the beginning of time T2 (note: this gives a total of 5120 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.6.2.1 in which $T_{Measurement\_Period\ intra\_TDD\_CRS}$ = 3 * $T_{DMTC\_periodicity}$ = 480ms.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CRS}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{measure\_scc\_CRS}$

where $T_{measure\_scc\_CRS}$ = 3 * *measCycleSCell*.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T3 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 and A2 are passed, otherwise fail the UE.

8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined

- Test procedure, message contents part are not updated according to latest change to C1 event.
- Test requirement part stll need to be updated except the table part

8.22.11.1 Test purpose

The purpose of this test is to verify that the UE correctly detects events C1 (CSI-RS resource becomes better than threshold) defined in TS 36.331 [6] when CSI-RS based discovery signal is configured within the requirements stated in TS36.133 [4] clause 8.7.3.4.1.

8.22.11.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 12 and forward that support [CA and CSI-RS based discovery signals measurement]. Applicability requires support for FGI bit 111.

8.22.11.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD TP on a secondary component carrier within $T_{identify\_scc\_TP\_SCE}$, according to the parameter *measCycleSCell*, where $T_{identify\_scc\_TP\_SCE} = T_{identify\_scc\_SCE} + T_{measure\_scc\_CSI\text{-}RS}$,

A cell shall be considered detectable when

- CSI-RSRP related side condition given in TS 36.133 [4] Clause 9.1.15 are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.11 for a corresponding Band

$T_{identify\_scc\_SCE}$ is the intra-frequency period for cell identification in TS 36.133 [4]section 8.7.2.4.1. $T_{measure\_scc\_CSI\text{-}RS}$ is the intra-frequency period for TP measurement in table 8.22.11.3-1.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CSI\text{-}RS}$ according to the parameter *measCycleSCell* as shown in tables 8.22.11.3-1 and 8.22.11.3-1.

Table 8.22.11.3-1: Requirement to measure intra frequency TP on FDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CSI\text{-}RS}$ [ms]
≥ 6	≥1	5* *measCycleSCell*
≥ 25	≥1	3* *measCycleSCell*

Table 8.22.11.3-2: Requirement to measure intra frequency TP on TDD SCC with deactivated SCell

Measurement bandwidth [RB]	Discovery signal occasion duration (*ds-OccasionDuration*) [ms]	$T_{measure\_scc\_CSI\text{-}RS}$ [ms]
≥ 6	≥2	5* *measCycleSCell*
≥ 25	≥2	3* *measCycleSCell*

The UE shall be capable of performing RSRP measurements for 3 identified TPs on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc\_CSI\text{-}RS}$.

The measurement accuracy for all measured TPs shall be as specified in the TS 36.133 [4] sub-clause 9.1.15.

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on one or two SCCs with deactivated SCell. This may cause interruptions on PCell or an activated SCell or both that are specified in TS 36.133 [4] Section 7.8.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_TP\_SCE}$ defined in Clause 8.7.3.4.1. When L3 filtering is used or IDC autonomous denial is configured an additional delay can be expected.

If a TP which has been detectable at least for the time period $T_{identify\_scc\_TP\_SCE}$ defined in TS 36.133 [4] clause 8.7.3.4.1 becomes undetectable for a period $\leq$ 5 seconds and then the TP becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc\_CSI-RS}$ provided the timing to that TP has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.3.4.1 and A.8.22.11.

8.22.11.4 Test description

8.22.11.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.1.4.1-1 > use Table 8.22.11.4.1-1.

- Instead of clause 8.16.1.4.3 > use clause 8.22.11.4.3.

Table 8.22.11.4.1-1: General test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
C1	Hysteresis	dB	0	Hysteresis for evaluation of event C1.
	Threshold CSI-RSRP	dBm	-93	Actual RSRP threshold for event C1. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.14.3 into account plus margin.
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
Cell3 timing offset to cell1		µs	3	Synchronous cells
T1		s	5	
T2		s	5	
T3		s	10	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.11.4.2 Test procedure

It is indicated to the UE in the measurement control information that event-triggered reporting with Events A2 (PCell and SCell) and A6 is used. The test consists of three successive time periods, with duration of T1, T2 and T3, respectively. During T1 the UE shall not have any information on cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased to same level as for cell 2, and due to usage of an offset this shall result in reporting of Event A6. At beginning of T3 the transmission powers of cells 1, 2 and 3 are reduced below a threshold value and this shall result in reporting of Event A2 for PCell and SCell, respectively.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.22.11.4.3.
4. Set the parameters according to T1 in Table 8.22.11.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.22.11.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 6082ms, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.22.11.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A2 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 482ms, then count a success for the event “Cell 1 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A2” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 962ms, then count a success for the event “Cell 2 A2”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A2” is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

13. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A6”, “Cell 1 A2” and “Cell 2 A2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.22.11.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.10.4.3-1: Common Exception messages for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.22.10.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.10.4.3-3: RadioResourceConfigCommonSCell-r10

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.10.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.22.1.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

Table 8.22.6.4.3-6: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	1		
csi-RS-IndividualOffset-r12	1		
}			
}			
}			
}			
}			

Table 8.16.2.4.3-7: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.10.4.3-8: *ReportConfig-A2-H*

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	false		
}			

Table 8.22.10.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.22.10.4.3-10: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.22.6.4.3-11: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

8.22.11.5 Test requirement

Table 8.22.11.4-1 and Table 8.22.11.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CSI-RS based discovery signal.

Table 8.22.11.5-1: Cell specific test parameters for E-UTRAN FDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD as in A.1.1			DL Reference Measurement Channel R.0 FDD as in A.1.1			DL Reference Measurement Channel R.0 FDD as in A.1.1		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD as in A.2.1			DL Reference Measurement Channel R.6 FDD as in A.2.1			DL Reference Measurement Channel R.6 FDD as in A.2.1		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD			OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101+TT			-101+TT					
RSRP Note 3	dBm/15 kHz	-104+TT	-82+TT	-82+TT	-104+TT	-82+TT	-82+TT	-infinity	-infinity	-82+TT
CSI-RSRP Note 3	dBm/15 kHz	-98+TT	-76+TT	-76+TT	-98+TT	-76+TT	-76+TT	-infinity	-infinity	-76+TT
SCH_RP Note 3	dBm/15 kHz	-104+TT	-82+TT	-82+TT	-104+TT	-82+TT	-82+TT	-infinity	-infinity	-82+TT
$\hat{E}_s/N_{oc}$	dB	-3+TT	19+TT	19+TT	-3+TT	19+TT	19+TT	-infinity	-infinity	19+TT
CRS $\hat{E}_s/I_{ot}$	dB	-3+TT	19+TT	19+TT	-3+TT	-0.05+TT	-0.05+TT	-infinity	-infinity	-0.05+TT
CSI-RS $\hat{E}_s/I_{ot}$	dB	3+TT	25+TT	25+TT	-3+TT	5.95+TT	5.95+TT	-infinity	-infinity	5.95+TT
CSI-RS resource configurations [9]		2			4			6		
p-C-r10 [5]	dB	-6			-6			-6		
CSI-RS subframe offset		0			0			0		
CSI-RS individual offset [5]	[dB]	0			0			0		
CSI-RS muting		Enable			Enable			Enable		
Propagation Condition		ETU30			ETU30			ETU30		
Time offset to cell 1	us	0			0			2.3 (CP/2)		

Time alignment error relative to cell1 Note 5	us	-	≤ TAE	N/A
Timing offset to Cell 2	μs	-	-	2.3 (CP/2)
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP, CSI-RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.				

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2 \times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_TP\_SCE}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc\_TP\_SCE} = T_{identify\_scc\_SCE} + T_{measure\_scc\_CSI-RS}$

$T_{identify\_scc\_SCE} = T_{identify\_scc\_CRS} = 13 * \textit{measCycleSCell} + T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS} = 3 * \textit{measCycleSCell}$

$T_{measure\_scc\_CSI-RS} = 3 * \textit{measCycleSCell}$

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS} = 19 * \textit{measCycleSCell} = 6080$ ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6082 ms from the beginning of time T2 (note: this gives a total of 6080 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or FDD) in TS 36.133 [4] clause 8.6.3.1 in which $T_{Measurement_Period_intra_FDD_CSI-RS} = 3 * T_{DMTC_periodicity} = 480$ms.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CSI-RS}$ according to the parameter *measCycleSCell*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{measure\_scc\_CSI-RS}$

where $T_{measure\_scc\_CSI-RS} = 3 * \textit{measCycleSCell}$.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T3 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 and A2 are passed, otherwise fail the UE.

8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Test procedure, message contents part are not updated according to latest change to C1 event.
- Test requirement part stll need to be updated except the table part

8.22.12.1 Test purpose

Same test purpose as in clause 8.22.11.1.

8.22.12.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 12 and forward that support [CA and CSI-RS based discovery signals measurement]. Applicability requires support for FGI bit 111.

8.22.12.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 8.22.11.3.

The normative reference for this requirement is TS 36.133 [4] clause 8.7.3.4.1 and A.8.22.12.

8.22.12.4 Test description

8.22.12.4.1 Initial conditions

Same Initial conditions as defined in clause 8.16.2.4.1 with the following exceptions:

- Instead of Table 8.16.2.4.1-1 -> use Table 8.22.12.4.1-1.
- Instead of clause 8.16.2.4.3 -> use clause 8.22.12.4.3.

Table 8.22.12.4.1-1: General test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2.
Neighbour cell			Cell 3	Neighbour cell to be identified on RF channel number 2.
DMTC period		ms	160	As specified in IE MeasDS-Config in TS 36.331[5]
dmtc-PeriodOffset for cells 2 and 3		ms	10	As specified in IE MeasDS-Config in TS 36.331[5]
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331[5]
Channel Bandwidth ($BW_{channel}$)		MHz	10	Channel bandwidth for cells on primary and secondary component carriers
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211[9]. The same configuration applies to all cells.
Uplink-downlink configuration			1	
DRX			OFF	Continuous monitoring of primary cell
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-93	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on secondary component carrier.
Filter coefficient			0	L3 filtering is not used
SCell measurement cycle (measCycleSCell)		ms	320	
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	5	UE should report Event A6 within 6.08s (19×scellMeasCycle)
T3		s	10	UE should report Event A2 within 200 ms and 960s for cells 1 and 2, respectively.
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.				

8.22.12.4.2 Test procedure

Same test procedure as in clause 8.22.11.4.2 with the following exceptions:

- Instead of clause 8.22.11.4.3 for message content exceptions → use clause 8.22.10.4.3.
- Instead of Table 8.22.11.5-1 → use Table 8.22.12.5-1.

8.22.12.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.22.12.4.3-1: Common Exception messages for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.1-5 Table H.4.1-6 with A6-Offset = - 6dB

Table 8.22.12.4.3-2: *SCellToAddMod-r10*

Derivation Path: 36.508, Table 4.6.3-19D			
Information Element	**Value/remark**	**Comment**	**Condition**
SCellToAddMod-r10 ::= SEQUENCE {			
sCellIndex-r10	1		
cellIdentification-r10 SEQUENCE {			
physCellId-r10	PhysicalCellIdentity of Cell 2		
dl-CarrierFreq-r10	Same downlink EARFCN as used for Cell 2		
}			
}			

Table 8.22.12.4.3-3: RadioResourceConfigCommonSCell-r10

Derivation Path: 36.508, Table 4.6.3-13A			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigCommonSCell-r10 ::= SEQUENCE {			
nonUL-Configuration-r10 SEQUENCE {			
dl-Bandwidth-r10	Same downlink system bandwidth as used for Cell 2		
}			
}			

Table 8.22.12.4.3-4: *MeasConfig*

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2, 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A6		
reportConfig[1]	ReportConfig-A6		
reportConfigId[2]	IdReportConfig-A2		
reportConfig[2]	ReportConfig-A2-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	3 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A6		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A2		
measId[3]	3		
measObjectId[3]	IdMeasObject-f2		
reportConfigId[3]	IdReportConfig-A2		
}			
}			

Table 8.22.12.4.3-5: MeasObjectEUTRA-GENERIC(Freq)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

Table 8.22.12.4.3-6: MeasObjectEUTRA-GENERIC(f1)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	mbw50		
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {			
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId	Cell1	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId	Cell2	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	1		
csi-RS-IndividualOffset-r12	1		
}			
}			
}			
}			
}			

Table 8.22.12.4.3-7: MeasObjectEUTRA-GENERIC(f2)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.22.12.4.3-8: *ReportConfig-A2-H*

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2(-90)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A2(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	47	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
reportCRS-Meas-r12	**true**		
triggerQuantityCSI-RS-r12	**false**		
}			

Table 8.22.12.4.3-9: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	2		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			

Table 8.22.12.4.3-10: *MeasurementReport*

Derivation path: 36.508 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	3		
measResultPCell::= SEQUENCE {		Report Cell 1	
rsrpResult	(0..97)		
rsrqResult	(0..34)		
}			
measResultNeighCells CHOICE { }	Not present		
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		Cell 2	
rsrpResultSCell-r10	(0..97)		
rsrqResultSCell-r10	(0..34)		
}			
}			
}			
}			
}			
}			
}			

Table 8.22.12.4.3-11: *QuantityConfig-DEFAULT*

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

8.22.12.5 Test requirement

Table 8.22.12.4-1 and Table 8.22.12.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test based on CSI-RS based discovery signal.

Table 8.22.12.5-1: Cell specific test parameters for E-UTRAN TDD event triggered reporting on configured but deactivated SCell in non-DRX under fading propagation conditions for CSI-RS based measurements under discovery signal

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2			2		
$BW_{channel}$	MHz	10			10			10		
Measurement bandwidth	n_{PRB}	13-37			13-37			13-37		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD As in A.1.2			DL Reference Measurement Channel R.0 TDD As in A.1.2			DL Reference Measurement Channel R.0 TDD As in A.1.2		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD as in A.2.2			DL Reference Measurement Channel R.6 TDD as in A.2.2			DL Reference Measurement Channel R.6 TDD as in A.2.2		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low			1x2 Low		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD			OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0			0		
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB									
PDCCH_RA	dB									
PDCCH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA Note 1	dB									
OCNG_RB Note 1	dB									
N_{oc} Note 2	dBm/15 kHz	-101+TT			-101+TT					
RSRP Note 3	dBm/15 kHz	dBm/15	-82+TT	-82+TT	-82+TT	-82+TT	-82+TT	-infinity	-infinity	-82+TT
CSI-RSRP Note 3	dBm/15 kHz	dBm/15	-76+TT	-76+TT	-98+TT	-76+TT	-76+TT	-infinity	-infinity	-76+TT
SCH_RP Note 3	dBm/15 kHz	dBm/15	-82+TT	-82+TT	-82+TT	-82+TT	-82+TT	-infinity	-infinity	-82+TT
$\hat{E}_s/N_{oc}$	dB	dBm/15	19+TT	19+TT	19+TT	19+TT	19+TT	-infinity	-infinity	19+TT
CRS $\hat{E}_s/I_{ot}$	dB	dBm/15	19+TT	19+TT	19+TT	-0.05+TT	-0.05+TT	-infinity	-infinity	-0.05+TT
CSI-RS $\hat{E}_s/I_{ot}$	dB	dBm/15	25+TT	25+TT	25+TT	5.95+TT	5.95+TT	-infinity	-infinity	5.95+TT
Propagation Condition		ETU30								
CSI-RS resource configurations [9]		0			2			4		
CSI-RS subframe offset		0			0			0		
CSI-RS individual offset [5]	[dB]	0			0			0		
CSI-RS muting		Enable			Enable			Enable		
p-C-r10 [5]	dB	-6			-6			-6		
Time offset to cell 1	us	0			0			2.3 (CP/2)		

Time alignment error relative to cell1 Note 5	us	-	≤ TAE	N/A
Timing offset to Cell 2	μs	-	-	2.3 (CP/2)
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 5: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.				

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc\_TP\_SCE}$

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{identify\_scc\_TP\_SCE} = T_{identify\_scc\_SCE} + T_{measure\_scc\_CSI\text{-}RS}$

$T_{identify\_scc\_SCE} = T_{identify\_scc\_CRS} = 13 * \mathit{measCycleSCell} + T_{measure\_scc\_CRS}$

$T_{measure\_scc\_CRS} = 3 * \mathit{measCycleSCell}$

$T_{measure\_scc\_CSI\text{-}RS} = 3 * \mathit{measCycleSCell}$

measCycleSCell = 320 ms

$T_{identify\_scc\_CRS} = 19 * \mathit{measCycleSCell} = 6080$ ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 6082 ms from the beginning of time T2 (note: this gives a total of 6080 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

In the RRC_CONNECTED state, the measurements of the primary component carrier shall meet all applicable requirements (FDD or TDD) in TS 36.133 [4] clause 8.6.3.1 in which $T_{Measurement_Period_intra_TDD_CSI\text{-}RS} = 3 * T_{DMTC_periodicity} = 480$ms.

The UE shall send one Event A2 triggered measurement report for Cell 1 with a measurement reporting delay of less than 482 ms (including 2 ms for TTI insertion uncertainty) from beginning of time T3.

The measurement period for deactivated scell measurements is $T_{measure\_scc\_CSI\text{-}RS}$ according to the parameter *measCycleSCell.*

The overall delays measured test requirement for Event A2 for Cell 2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay $= T_{measure\_scc\_CSI\text{-}RS}$

where $T_{measure\_scc\_CSI\text{-}RS} = 3 * \mathit{measCycleSCell}$.

The UE shall send one Event A2 triggered measurement report for Cell 2 with a measurement reporting delay of less than 962ms from beginning of time T3 (note: this gives a total of 960 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95% for each of the events.

The statistical pass/ fail decisions are done separately for Event A6 and Event A2.

Decide the test pass, if events A6 and A2 are passed, otherwise fail the UE.

8.23 E-UTRAN Dual Connectivity Measurements

8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

8.23.1.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.23.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of synchronous Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.1.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as shown in Table 8.23.1.3-1.

Table 8.23.1.3-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (NOTE1)
0.04<DRX-cycle≤0.08	NOTE2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	NOTE2(20)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in Table 8.23.1.3-2 The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.23.1.3-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (NOTE1)
0.04<DRX-cycle≤2.56	NOTE2 (5)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.2, 8.8.3, 8.1.2.2 and A.8.23.1.

8.23.1.4 Test description

8.23.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.1.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2..

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.

2. The general test parameter settings are set up according to Table 8.23.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.1.4.3.

5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.1.4.1-1: General test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133 [4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.1.5.1-2
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		s	2	
T2		s	10	
T3		s	1	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.11.				

8.23.1.4.2 Test procedure

The test consists of two cells: Cell1 and Cell2. Cell1 is PCell and Cell2 is PSCell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A1 (PCell and PSCell) and A2 (PCell and PSCell) is used. The test consists of three successive time periods, with time durations of T1, T2 and T3, respectively. During time duration T1, the UE shall not have any timing information of Cell 2. Prior to the start of the time duration T1, the UE shall be fully synchronized to Cell1 and Cell2. Prior to the start of the time duration T1, DRX configurations on MCG and SCG are enabled and DRX inactivity timers for MCG and SCG have already been expired. Immediately at beginning of T2 the transmission powers of Cell1 and Cell2 are reduced below a threshold value of event A2 and this shall result in reporting of Event A2 for PCell and PSCell, respectively. Immediately after receiving the reporting of event A2 for both PCell and PSCell, PDCCH indicating a new transmission on Cell1 shall be sent continuously to ensure that the UE would not enter the DRX state on MCG throughout T3. At beginning of T3 the transmission powers of Cell1 and Cell2 are increased above a threshold value of event A1 and this shall result in reporting of Event A1 for PCell and PSCell, respectively.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure PCell (Cell1) and PSCell (Cell2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.1.4.3.

4. Set the parameters according to T1 in Table 8.23.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1 SS shall transmit an RRCConnectionReconfiguration message with events A2 and A1 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.1.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A2 for Cell1 and Cell2. If the measurement reporting delay from the beginning of time period T2 is less than 6402ms for Cell1 or less than 402ms for Cell2, then count a success for the event “A2”. Otherwise count a fail for the event “A2”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.23.1.5-1.

10. The UE shall transmit MeasurementReport messages triggered by Event A1 for Cell 1 and Cell 2, respectively.

10a. If the measurement reporting delay for Cell 1 from the beginning of time period T3 is less than 202ms for Cell1, then count a success for the event “Cell 1 A1”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 1 A1” is increased by one.

10b. If the measurement reporting delay for Cell 2 from the beginning of time period T3 is less than 402ms, then count a success for the event “Cell 2 A1”. If the UE sends event-triggered measurement reports before the beginning of time period T3 or fails to report the event within the overall delays measured requirement, then the number of failure for the event “Cell 2 A1 is increased by one.

11. After the SS receives the MeasurementReport message in step 8) and 10) or when T3 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 2 = physical cell identity of Cell 1 then skip this physical cell identity value for Cell 2.

13. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A),
or
- switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

14. Repeat step 3-13 until a test verdict has been achieved.

Each of the events “A2”, “Cell 1 A1” and “Cell 2 A1” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

8.23.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.23.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.4.1-5

Table 8.23.1.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_AddMod DC_Setup_SCG_DRB
}			
}			
}			

Table 8.23.1.4.3-3: MeasConfig: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation path: 36.508 clause 4.6.6 table 4.6.6-1			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	2 entries		
reportConfigId[1]	IdReportConfig-A2		
reportConfig[1]	ReportConfig-A2		
reportConfigId[2]	IdReportConfig-A1		
reportConfig[2]	ReportConfig-A1-H		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	2 entries		
measId[1]	1		
measObjectId[1]	IdMeasObject-f2		
reportConfigId[1]	IdReportConfig-A2		
measId[2]	2		
measObjectId[2]	IdMeasObject-f1		
reportConfigId[2]	IdReportConfig-A1		
}			
}			

Table 8.23.1.4.3-4: MeasObjectEUTRA-GENERIC(f2): Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 7.3.3 Table 7.3.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
cellsToAddModList SEQUENCE (SIZE (1..maxCellMeas)) { }	Not present		
measCycleSCell-r10	sf320		
}			

Table 8.23.1.4.3-5: *ReportConfig-A1*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-4 ReportConfigEUTRA-A1			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA1 SEQUENCE {			
a1-Threshold CHOICE {			
threshold-RSRP	45	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.23.1.4.3-6: *ReportConfig-A2*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DC in DRX under fading propagation conditions requirements

Derivation Path: 36.508 clause 4.6.6 table 4.6.6-5 ReportConfigEUTRA-A2			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A1(Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA2 SEQUENCE {			
a2-Threshold CHOICE {			
threshold-RSRP	41	The actual value is IE value – 140 dBm	
}			
}			
}			
hysteresis	0 (0 dB)		
timeToTrigger	0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

8.23.1.5 Test requirement

Tables 8.23.1.4.1-1 and 8.23.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.1.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
$\hat{E}_s/I_{ot}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
RSRP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
SCH_RP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
Io Note 3	dBm/Ch BW	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	µs	-			33		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3.
Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.1.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table 8.23.1.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

8.23.2.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra-frequency cell search requirements.

8.23.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of asynchronous Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.2.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\_intra}$ as shown in Table 8.23.2.3-1.

Table 8.23.2.3-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (NOTE1)
0.04<DRX-cycle≤0.08	NOTE2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	NOTE2(20)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133 [4] clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133 [4] Annex B.2 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in Table 8.23.2.3-2 The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.23.2.3-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (NOTE1)
0.04<DRX-cycle≤2.56	NOTE2 (5)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use NOTE2: Time depends upon the DRX cycle in use	

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clauses 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.2, 8.8.3, 8.1.2.2 and A.8.23.2.

8.23.2.4 Test description

8.23.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.2.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.2.4.3.

5. There are two E-UTRA FDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier. Cell 2 is PSCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.Table 8.23.2.4.1-1: General test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.2.5-2
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		s	2	
T2		s	10	
T3		s	1	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.11.				

8.23.2.4.2 Test procedure

Same test procedure as in clause 8.23.1.4.2 with the following exceptions:

- Instead of message content exceptions defined in clause 8.23.1.4.3 → use message content exception defined in clause 8.23.2.4.3.
- Instead of Table 8.23.1.5-1 → use Table 8.23.2.5-1

8.23.2.4.3 Message contents

Same message contents as in clause 8.23.1.4.3.

8.23.2.5 Test requirement

Tables 8.23.2.4.1-1 and 8.23.2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.23.2.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
$\hat{E}_s/I_{ot}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
RSRP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
SCH_RP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
Io Note 3	dBm/Ch BW	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	µs	-			500		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3. Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.							

Table 8.23.2.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table 8.23.2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

8.23.3.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra-frequency cell search requirements.

8.23.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of synchronous Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.3.3 Minimum conformance requirements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra}$ as shown in Table 8.23.3.3-1.

Table 8.23.3.3-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (NOTE1)
0.04<DRX-cycle≤0.08	NOTE2 (40)
0.128	3.2 (25)
0.128<DRX-cycle≤2.56	NOTE2(20)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use. NOTE2: Time depends upon the DRX cycle in use.	

A cell shall be considered detectable when

- RSRP related side conditions given in TS 36.133[4] Clause 9.1.2.1 and 9.1.2.2 and RSRQ related side conditions given in TS 36.133[4] Clause 9.1.5.1 are fulfilled for a corresponding Band,
- SCH_RP and SCH Ês/Iot according to TS 36.133[4] Annex B.2.1 for a corresponding Band

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in Table 8.23.3.3-2. The UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.23.3.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (NOTE1)
0.04<DRX-cycle≤2.56	NOTE2 (5)
NOTE1: Number of DRX cycle depends upon the DRX cycle in use. NOTE2: Time depends upon the DRX cycle in use.	

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clauses 9.1.2.1 and 9.1.2.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.5.1.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] sections 9.1.2.1, 9.1.2.2, and 9.1.5.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTIDCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T identify_intra defined in TS 36.133[4] Clause 8.1.2.2.2.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133[4] clause 8.1.2.2.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than Tmeasure_intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.2, 8.8.4, 8.1.2.2 and A.8.23.3.

8.23.3.4 Test description

8.23.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.3.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.42 as appropriate.
2. The general test parameter settings are set up according to Table 8.23.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.23.3.4.3.
5. There are two E-UTRA TDD carriers and two cells in the test. Cell 1 is PCell on the primary component carrier, Cell 2 is PSCell on the secondary component carrier, Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.23.3.4.1-1: General test parameters for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
A1	Hysteresis	dB	0	Hysteresis for evaluation of event A1.
	Threshold RSRP	dBm	-95	Actual RSRP threshold for event A1. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
A2	Hysteresis	dB	0	Hysteresis for evaluation of event A2.
	Threshold RSRP	dBm	-99	Actual RSRP threshold for event A2. Needs to take absolute accuracy tolerance in TS 36.133[4] clause 9.1.11.1 and 9.1.11.2 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX			ON	DRX related parameters are defined in Table 8.23.3.5-2
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	10	
T3		s	1	
NOTE: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1.				

8.23.3.4.2 Test procedure

Same test procedure as in clause 8.23.1.4.2 with the following exceptions:

- Instead of message content exceptions defined in clause 8.23.1.4.2 → use message content exception defined in clause 8.23.3.4.3.
- Instead of Table 8.23.1.5-1 → use Table 8.23.3.5-1

8.23.3.4.3 Message contents

Same message contents as in clause 8.23.1.4.3.

8.23.3.5 Test requirement

Tables 8.23.3.4.1-1 and 8.23.3.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.3.5-1: Cell specific test parameters for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
$\hat{E}_s/I_{ot}$	dB	16.20	-2.7	20.20	16.20	-2.7	20.20
RSRP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
SCH_RP Note 3	dBm/15 KHz	-87.8	-106.7	-83.8	-87.8	-106.7	-83.8
Io Note 3	dBm/Ch BW	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)	-59.92 +10log ($N_{RB,c}$ /50)	-74.35 +10log ($N_{RB,c}$ /50)	-55.98 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70			ETU70		
Correlation Matrix and Antenna Configuration		1x2 Low			1x2 Low		
Receive Time offset to cell1 Note 5	µs	-			33		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission in Cell1 are assigned to the UE prior to the start of time period T3.
Note 5: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.3.5-2: DRX-Configuration for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf1280	sf80	
shortDRX	disable	disable	

Table 8.23.3.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A2 triggered report for PCell on PCell with a measurement reporting delay less than 6.4s (5*MCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A2 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH to obtain allocation to send the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PCell on PCell with a measurement reporting delay less than 200ms from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall send one Event A1 triggered report for PSCell on PCell with a measurement reporting delay less than 400ms (5*SCG_DRX cycle) from the beginning of time period T3. The measurement reporting delay is defined as the time from the beginning of time period T3 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

8.23.4.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.23.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.4.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter}$ as shown in Table 8.23.4.3-1

Table 8.23.4.3-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles), normal performance		$T_{identify\_inter}$ (s) (DRX cycles), reduced performance	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ $(20*K_n*N_{freq,n})$	$7.68*K_n*N_{freq,n}$ $(30*K_n*N_{freq,n})$	$5.12*K_r*N_{freq,r}$ $(20*K_r*N_{freq,r})$	$7.68*K_r*N_{freq,r}$ $(30*K_r*N_{freq,r})$
0.32	$6.4*K_n*N_{freq,n}$ $(20*K_n*N_{freq,n})$	$7.68*K_n*N_{freq,nl}$ $(24*K_n*N_{freq,n})$	$6.4*K_r*N_{freq,r}$ $(20*K_r*N_{freq,r})$	$7.68*K_r*N_{freq,r}$ $(24*K_r*N_{freq,r})$
0.32< DRX-cycle≤2.56	Note $(20*K_n*N_{freq,n})$	Note $(20*K_n*N_{freq,n})$	Note $(20*K_r*N_{freq,r})$	Note $(20*K_r*N_{freq,r})$
Note: Time depends upon the DRX cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|$_{dBm}$ RSRP Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band
- other RSRP related side conditions given in TS 36.133[4] Clause 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133[4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- SCH_RP|$_{dBm}$ SCH Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.23.4.3-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.23.4.3-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal performance)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced performance)
≤0.08	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note $(5*K_n*N_{freq,n})$	Note $(5*K_r*N_{freq,r})$
Note: Time depends upon the DRX cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 provided the timing to that cell has not changed more than ± 50 T_s while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.4, 8.1.2.3 and A.8.23.4.

8.23.4.4 Test description

8.23.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.4.5-1 as defined in TS 36.508 [7] clause [4.3.1] for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in 3GPP TS 36.508 [7] Annex A figure group A.43 as appropriate.

2. The general test parameter settings are set up according to Table 8.23.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.4.4.3.

5. There are three E-UTRA FDD cells in the test. Cell 1 is PCell, Cell 2 is PSCell and Cell 3 is a inter-frequency neighbour cell. Cell 1 and Cell 2 are the cells used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 3 shall be powered OFF.

Table A.8.23.4.4.1-1: General test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
Neighbour cell			Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.4.5-2
Measurement gap pattern Id			0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: A UE capable of both synchronous and asynchronous DC operations is not required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.6.11.				

8.23.4.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3.

1. Ensure the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.
2. Configure MCG and SCG according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure the PCell (Cell 1) and PSCell (Cell 2) on the MCG and SCG as per TS 36.508 [7] clause 7.2A.3A with the message content exceptions defined in clause 8.23.4.4.3.
4. Set the parameters according to T1 in Table 8.23.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. The SS shall transmit an RRCConnectionReconfiguration message with event A3 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.23.4.5-1.
8. UE shall transmit a MeasurementReport message triggered by Event A3 for Cell 3 on PCell (Cell 1). If the measurement reporting delay from the beginning of time period T2 is less than 3922ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

9.. After the SS receives the MeasurementReport message in step 9) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

11. After the RRC connection release, the SS:
 - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in [State 3A] according to TS 36.508 [7] clause [4.5.3A] (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A,
 or
 - switches off and on the UE and ensures the UE is in State 3A-RF-DC1 according to TS 36.508 [7] clause 7.2A.3A.

12. Repeat steps 3-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.23.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.23.4.4.3-1: Common Exception messages for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.4.1-5

Table 8.23.4.4.3-2: *RRCConnectionReconfiguration:* Additional E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_AddMod DC_Setup_SCG_DRB
}			
}			
}			

Table 8.23.4.4.3-3: *MeasConfig:* Additional E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f3		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.23.4.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.23.4.5 Test requirement

Tables 8.23.4.4.1-1 and 8.23.4.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.4.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-101		-101		N/A	-101
$\hat{E}_s/N_{oc}$	dB	4	4	4	4	-infinity	7
$\hat{E}_s/I_{ot}$	dB	4	4	4	4	-infinity	7
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
Io Note 3	dBm/Ch BW	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	N/A	-65.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Receive Time offset to cell1 Note 4	µs	-		33		-	
Time offset to cell1	µs	-		-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.4.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table 8.23.4.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3922 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 80 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

$N_{freq,n}$ = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

K_n = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 80 ms

The overall delay measured when DRX cycle length is 80 ms shall be less than a total of 3922 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

8.23.5.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter-frequency cell search requirements.

8.23.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward of Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.5.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\_inter}$ as shown in Table 8.23.5.3-1

Table 8.23.5.3-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles), normal performance		$T_{identify\_inter}$ (s) (DRX cycles), reduced performance	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ $(20*K_n*N_{freq,n})$	$7.68*K_n *N_{freq,n}$ $(30*K_n *N_{freq,n})$	$5.12*K_r*N_{freq,r}$ $(20*K_r*N_{freq,r})$	$7.68*K_r *N_{freq,r}$ $(30*K_r *N_{freq,r})$
0.32	$6.4*K_n *N_{freq,n}$ $(20*K_n *N_{freq,n})$	$7.68*K_n *N_{freq,nl}$ $(24*K_n *N_{freq,n})$	$6.4*K_r *N_{freq,r}$ $(20*K_r *N_{freq,r})$	$7.68*K_r *N_{freq,r}$ $(24*K_r *N_{freq,r})$
0.32< DRX-cycle≤2.56	Note $(20*K_n *N_{freq,n})$	Note $(20*K_n *N_{freq,n})$	Note $(20*K_r *N_{freq,r})$	Note $(20*K_r *N_{freq,r})$
Note: Time depends upon the DRX cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ RSRP Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,
- other RSRP related side conditions given in TS 36.133[4] Clause 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133[4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ SCH Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.23.5.3-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.23.5.3-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal performance)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced performance)
≤0.08	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133[4] sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] sections 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 and then triggers the measurement report as per TS 36.331 [5], the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ defined in TS 36.133[4] clause 8.1.2.3.1.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.8.4, 8.1.2.3 and A.8.23.5.

8.23.5.4 Test description

8.23.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.5.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure group A.43 as appropriate..

2. The general test parameter settings are set up according to Table 8.23.5.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.5.4.3.

5. There are three E-UTRA FDD cells in the test. Cell1 is PCell, Cell2 is PSCell and Cell3 is a inter-frequency neighbour cell. Cell1 and Cell2 are the cells used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 3 shall be powered OFF.

Table 8.23.5.4.1-1: General test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
Neighbour cell			Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	s	0	
CP length			Normal	
DRX			ON	DRX related parameters are defined in Table 8.23.5.5-2
Measurement gap pattern Id			0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1. Note 2: Even a UE capable of both synchronous and asynchronous DC operations is required to pass this test case in accordance with the principle defined in TS 36.133[4] section A.3.11.				

8.23.5.4.2 Test procedure

Same Test Procedure as in clause 8.23.4.4.2 with the following exceptions:

- Instead of clause 8.23.4.4.3 → use clause 8.23.5.4.3.
- Instead of Table 8.23.4.5-1 → use Table 8.23.5.5-1.

8.23.5.4.3 Message contents

Same Message contents as in clause 8.23.4.4.3.

8.23.5.5 Test requirement

Tables 8.23.5.4.1-1 and 8.23.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.23.5.5-1: Cell specific test parameters for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	
OCNG Patterns		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD		5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-101		-101		N/A	-101
$\hat{E}_s/N_{oc}$	dB	4	4	4	4	-infinity	7
$\hat{E}_s/I_{ot}$	dB	4	4	4	4	-infinity	7
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
Io Note 3	dBm/Ch BW	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	N/A	-65.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Receive time offset to cell1 Note 4	µs	-		500		-	
Time offset to cell1	µs	-		-		400	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.5.5-2: DRX-Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table 8.23.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3922 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 80 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

$N_{freq,n}$ = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

K_n = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 80 ms

The overall delay measured when DRX cycle length is 80 ms shall be less than a total of 3922 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

8.23.6.1 Test purpose

To verify the Dual Connectivity UE's ability to make correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD inter-frequency cell search requirements.

8.23.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward of Dual Connectivity. Applicability requires support for FGI bit 5.

8.23.6.3 Minimum conformance requirements

The UE shall be able to identify new inter-frequency cells and perform RSRP and RSRQ measurements of identified inter-frequency cells if carrier frequency information is provided by the PCell, even if no explicit neighbour list with physical layer cell identities is provided.

When DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps, the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in Table 8.23.6.3-1.

Table 8.23.6.3-1: Requirement to identify a newly detectable TDD interfrequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles) (normal performance)		$T_{identify\_inter}$ (s) (DRX cycles) (reduced performance)	
	Gap period = 40 ms	Gap period = 80 ms	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable
0.256	$5.12*K_n*N_{freq,n}$ $(20*K_n*N_{freq,n})$	$7.68*K_n*N_{freq,n}$ $(30*K_n*N_{freq,n})$	$5.12*K_r*N_{freq,r}$ $(20*K_r*N_{freq,r})$	$7.68*K_r*N_{freq,r}$ $(30*K_r*N_{freq,r})$
0.32	$6.4*K_n*N_{freq,n}$ $(20*K_n*N_{freq,n})$	$7.68*K_n*N_{freq,n}$ $(24*K_n*N_{freq,n})$	$6.4*K_r*N_{freq,r}$ $(20*K_r*N_{freq,r})$	$7.68*K_r*N_{freq,r}$ $(24*K_r*N_{freq,r})$
0.32<DRX-cycle≤2.56	Note $(20*K_n*N_{freq,n})$	Note $(20*K_n*N_{freq,n})$	Note $(20*K_r*N_{freq,r})$	Note $(20*K_r*N_{freq,r})$
Note: Time depends upon the DRX cycle in use				

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$ and RSRP Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band
- RSRP related side conditions given in TS 36.133[4] Clause 9.1.3.1 and 9.1.3.2 and RSRQ related side conditions given in TS 36.133[4] Sections 9.1.6.1 and 9.1.6.2 are fulfilled,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to TS 36.133[4] Annex B.2.3 for a corresponding Band,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency for up to 3 TDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.23.6.3-2 when DRX is in use, either measurement gaps are scheduled or the UE supports capability of conducting such measurements without gaps.

Table 8.23.6.3-2: Requirement to measure TDD interfrequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles) (normal requirement)	$T_{measure\_inter}$ (s) (DRX cycles) (reduced requirement)
≤0.08	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable	Non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable
0.128	When configuration 2 non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable, Otherwise Note ($5*K_n*N_{freq,n}$)	When configuration 2 non DRX Requirements in TS 36.133[4] clause 8.1.2.3.2.1 are applicable, Otherwise Note ($5*K_r*N_{freq,r}$)
0.128<DRX-cycle≤2.56	Note ($5*K_n*N_{freq,n}$)	Note ($5*K_r*N_{freq,r}$)
Note: Time depends upon the DRX cycle in use		

The RSRP measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clauses 9.1.3.1 and 9.1.3.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clauses 9.1.6.1 and 9.1.6.2.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133[4] clause 9.1.3.1, 9.1.3.2, 9.1.6.1, and 9.1.6.2, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133[4] Clause 8.1.2.3.2.2. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify\_Inter}$ in TS 36.133[4] clause 8.1.2.3.2.2 and then triggers the measurement report as per TS 36.331[5], the event triggered measurement reporting delay shall be less than $T_{measure\_inter}$ in TS 36.133[4] clause 8.1.2.3.2.2 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or the UE is performing reception and/or transmission for ProSe Direct Discovery and/or ProSe Direct Communication, an additional delay can be expected.

The normative reference for this requirement is TS 36.133[4] clause 8.8.4, 8.1.2.3 and A.8.23.6.

8.23.6.4 Test description

8.23.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 8.23.6.5-1 as defined in TS 36.508 [7] clause 4.3.1- for different DC configurations (per band) as defined in TS 36.521-1 [10] clause 5.4.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure group A.43 as appropriate.

2. The general test parameter settings are set up according to Table 8.23.6.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.23.6.4.3.

5. There are three E-UTRA TDD cells in the test. Cell1 is PCell, Cell2 is PSCell and Cell3 is a inter-frequency neighbour cell. Cell1 and Cell2 are the cells used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 3 shall be powered OFF.

Table 8.23.6.4.1-1: General test parameters for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2, 3	Three radio channels are used for this test.
Active PCell			Cell1	PCell on RF channel number 1.
Configured PSCell			Cell2	PSCell on RF channel number 2.
Neighbour cell			Cell3	Neighbour cell on RF channel number 3.
A3	Hysteresis	dB	0	Hysteresis for evaluation of event A3.
	A3-offset	dB	-6	
	Time To Trigger	s	0	
CP length			Normal	
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX			ON	DRX related parameters are defined in Table 8.23.6.5-2
Measurement gap pattern Id			0	
Cell-individual offset for cells on RF channel number 1		dB	0	Individual offset for cells on primary component carrier.
Cell-individual offset for cells on RF channel number 2		dB	0	Individual offset for cells on carrier frequency of Cell2.
Cell-individual offset for cells on RF channel number 3		dB	0	Individual offset for cells on carrier frequency of Cell3.
Filter coefficient			0	L3 filtering is not used
T1		s	5	
T2		s	5	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133[4] section A.3.6.1.				

8.23.6.4.2 Test procedure

Same Test Procedure as in clause 8.23.4.4.2 with the following exceptions:

- Instead of clause 8.23.4.4.3 → use clause 8.23.6.4.3.
- Instead of Table 8.23.4.5-1 → use Table 8.23.6.5-1.

8.23.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.23.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.4.1-5

Table 8.23.6.4.3-2: *RRCConnectionReconfiguration:* Additional E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
dedicatedInfoNASList	Set according to specific message content		AM-DRB-ADD(1)
radioResourceConfigDedicated	RadioResourceConfigDedicated-AM-DRB-ADD(1)		AM-DRB-ADD(1)
}			
nonCriticalExtension SEQUENCE {			
scg-Configuration-r12	SCG-Configuration-r12-DEFAULT		PSCell_AddMod DC_Setup_SCG_DRB
}			
}			
}			

Table 8.23.6.4.3-3: *MeasConfig:* Additional E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation path: TS 36.508 [7] clause 4.6.6 table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entries		
measObjectId[1]	IdMeasObject-f1		
measObject[1]	MeasObjectEUTRA-GENERIC(f1)	Cell 1	
measObjectId[2]	IdMeasObject-f2		
measObject[2]	MeasObjectEUTRA-GENERIC(f2)	Cell 2	
measObjectId[3]	IdMeasObject-f3		
measObject[3]	MeasObjectEUTRA-GENERIC(f3)	Cell 3	
}			
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId[1]	IdReportConfig-A3		
reportConfig[1]	ReportConfigEUTRA-A3		
}			
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId[1]	1		
measObjectId[1]	IdMeasObject-f3		
reportConfigId[1]	IdReportConfig-A3		
}			
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
}			

Table 8.23.6.4.3-4: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			
}			

8.23.6.5 Test requirement

Tables 8.23.6.4.1-1 and 8.23.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.23.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patterns		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_PB	dB						
PDCCH_RA	dB						
PDCCH_PB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 KHz	-101		-101		N/A	-101
$\hat{E}_s/N_{oc}$	dB	4	4	4	4	-infinity	7
$\hat{E}_s/I_{ot}$	dB	4	4	4	4	-infinity	7
RSRP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
SCH_RP Note 3	dBm/15 KHz	-97	-97	-97	-97	-infinity	-94
Io Note 3	dBm/Ch BW	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	-67.76 +10log ($N_{RB,c}$ /50)	N/A	-65.43 +10log ($N_{RB,c}$ /50)
Propagation Condition		ETU70		ETU70		ETU70	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Receive Time offset to cell1 Note 4	µs	-		33		-	
Time offset to cell1	µs	-		-		3	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: Receive time difference between subframe boundaries of signals received from the two cells at the UE antenna connector including time alignment error between the two cells.

Table 8.23.6.5-2: DRX-Configuration for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in clause 6.3.2 in TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf80	sf1280	
shortDRX	disable	disable	

Table 8.23.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC

Field	Cell1	Cell2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in clause 6.3.2 in TS 36.331
sr-ConfigIndex	0	0	For further information see clause 6.3.2 in TS 36.331 and section10.1 in TS 36.213.

The UE shall send one Event A3 triggered measurement report for Cell 3 on PCell, with a measurement reporting delay less than 3922 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 80 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq,n} \cdot K_n \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS 36.133 [4] clause 8.1.2.1.

$N_{freq,n}$ = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

K_n = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 80 ms

The overall delay measured when DRX cycle length is 80 ms shall be less than a total of 3922 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.24 Proximity-based Services

8.24.1 FFS

8.24.2 FFS

8.24.3 E-UTRAN FDD - Initiation/Cease of SLSS Transmission with ProSe Direct Discovery

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Message contents are TBD.

- Connection diagrams are TBD

- Annex E updates are pending.

8.24.3.1 Test purpose

To verify the ProSe UE's ability to initiate and cease SLSS transmissions and if the UE meets the maximum evaluation time.

8.24.3.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward which support ProSe Direct Communication.

8.24.3.3 Minimum conformance requirements

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 1.96 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 1.96 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.24.3.4.1-1 in clause 8.24.3.4.1) for the parameters in this test;

SLSS period is set to 40ms.

8.24.3.4 Test description

8.24.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz or 10 Mhz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 8.24.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.24.3.4.3.
5. There is one E-UTRA FDD carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.24.3.4.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell		Cell 1	E-UTRA FDD Cell1 on RF channel number 1
CP length of Cell 1		Normal	
Layer 3 filtering		Disabled	L3 filtering is not used
drx-Configuration		DRX_P1	As specified in Table A.3.12.2-1
T1	s	3	
T2	s	5.24	
T3	s	5.24	

Table 8.24.3.4.1-2: ProSe Direct Communication configuration for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	UL carrier frequency
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	According to principle defined in clause A.3.12.3
ProSe Direct Communication configuration		As specified in Table A.3.12.5-1 (Configuration #1)	IE values unless specified otherwise in this test.
networkControlledSyncTx		Not configured	
syncTxThreshIC	dBm/15 kHz	-95	In SIB18

Table 8.24.3.4.1-3: General Test Parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
OCNG Patterns defined in A.3.2.1.2 Note 4		5MHz: OP.16 FDD 10 MHz: OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note 1				
OCNG_RB Note 1				
N_{oc} Note2	dBm/15 kHz	-95		
$\hat{E}_s/N_{oc}$	dB	4.5	-4.5	4.5
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: This test is according to the principle defined in section A.3.12.3.

8.24.3.4.2 Test procedure

There is one active cell (PCell) in this test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the RSRP of the PCell is above *syncTxThreshIC* and the UE is not expected to be transmitting SLSS. During T2, the RSRP of the PCell is lowered below *syncTxThreshIC* and the UE is expected to initiate SLSS transmissions. During T3, the RSRP of the PCell is increased back to be above *syncTxThreshIC* and the UE is expected to cease SLSS transmissions.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode D is activated.
2. Set the parameters according to T1 in Table 8.24.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.24.3.5-1.
4. UE is expected to initiate a SLSS transmissions inside 1.96 s from the start of T2.
5. After the SS is able to measure the SLSS in step 6) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 8.24.3.5-1.
6. UE is expected to cease SLSS transmission inside 1.96s from the start of T3.
7. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 4 with test loop mode 4 activated according to TS 36.508 [7] clause 4.5.4.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.24.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with FFS:

Table 8.24.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	FFS

8.24.3.5 Test requirement

Tables 8.24.3.4.1-1 and 8.24.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-Initiation/Cease of SLSS Transmission with ProSe Direct Discovery.

Table 8.24.3.5-1: Cell Specific Test requirement Parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
OCNG Patterns defined in A.3.2.1.2 Note 4		5MHz: OP.16 FDD 10 MHz: OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note 1				
OCNG_RB Note 1				
N_{oc} Note2	dBm/15 kHz	-95		
$\hat{E}_s/N_{oc}$	dB	4.5	-4.5	4.5
RSRP Note3	dBm/15 kHz	-90.5	-99.5	-90.5
SCH_RP Note 3	dBm/15 kHz	-90.5	-99.5	-90.5
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: This test is according to the principle defined in section A.3.12.3.				

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 1.96 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 1.96 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 1.92 sec (see Table 8.24.3.4.1-1 in clause 8.24.3.4.1) for the parameters in this test;

SLSS period is set to 40ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.25

8.26 E-UTRAN-LAA Measurements

8.26.1 LAA SCell activation and deactivation of known SCell with E-UTRA FDD PCell in non-DRX

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined
- The Test tolerances applicable to this test are undefined
- Message contents are TBD.
- Connection diagrams are TBD
- Test procedures is TBD.
- Annex E updates are pending.

8.26.1.1 Test purpose

To verify that the LAA SCell activation and deactivation times are within the requirements when the SCell is known by the UE at the time of activation.

8.26.1.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 13 and forward that support LAA. Applicability requires support for IE laa-Parameters-r13.

8.26.1.3 Minimum conformance requirements

The delay within which the UE shall be able to activate the deactivated LAA SCell depends upon the specified conditions.

The requirements in this section shall apply for E-UTRA carrier aggregation of one FDD PCell or one TDD PCell and one SCell following the frame structure type 3 [16].

The delay within which the UE shall be able to activate the deactivated SCell depends upon the specified conditions.

Upon receiving SCell activation command in subframe n, the UE shall be capable to transmit valid CSI report and apply actions related to the activation command as specified in [17] for the SCell being activated no later than in subframe $n+T_{activate\_basic\_FS3}$, provided the following conditions are met for the SCell:

- During the period equal to max(5 measCycleSCell, 5 DRX cycles) before the reception of the SCell activation command:
  - the UE has sent a valid measurement report for the SCell being activated and
  - the SCell being activated remains detectable according to the cell identification conditions specified in section 8.3.3.2,
- SCell being activated also remains detectable during the SCell activation delay according to the cell identification conditions specified in section 8.3.3.2.

$T_{activate\_basic\_FS3}$ = 16 ms + $T_{DMTC\_duration}$ + (L+2) * $T_{DMTC\_periodicity}$, where

$T_{DMTC\_duration}$ =6 ms is the DMTC duration [2],

$T_{DMTC\_periodicity}$ is the periodicity of the DMTC [2],

L is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

Otherwise upon receiving the SCell activation command in subframe *n*, the UE shall be capable to transmit a valid CSI report and apply actions related to the activation command as specified in [17] for the SCell being activated no later than in subframe n+$T_{activate\_basic\_FS3}$, provided the SCell can be successfully detected on the first attempt. In this case, Tactivate_basic_FS3 is defined as follows.

$T_{activate\_basic\_FS3}$ = 16 ms + $T_{DMTC\_duration}$ + (L+3) * $T_{DMTC\_periodicity}$, where

$T_{DMTC\_duration}$ = 6 ms is the DMTC duration [2],

$T_{DMTC\_periodicity}$ is the periodicity of the DMTC [2],

L is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

If there is no reference signal received for the CSI measurement over the delay corresponding to the minimum requirements specified above, then the UE shall report corresponding valid CSI for the activated SCell on the next available uplink reporting resource after receiving the reference signal.

If there are no uplink resources for reporting the valid CSI in subframe n+ $T_{activate\_basic\_FS3}$ then the UE shall use the next available uplink resource for reporting the corresponding valid CSI.

The valid CSI is based on the UE measurement and corresponds to any CQI value specified in [3] with the exception of CQI index = 0 (out of range) provided:

- the conditions in section 7.7 are met over the entire SCell activation delay and
- the conditions for CQI reporting defined in Section 7.2.3 of [3] are met.

In addition to CSI reporting defined above, UE shall also apply other actions related to the activation command specified in [17] for an SCell at the first opportunities for the corresponding actions once the SCell is activated.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe *n+9* when PCell belongs to E-UTRA FDD.

The PCell interruption specified in section 7.8.2 shall not occur before subframe n+5 and not occur after subframe *n+11* when PCell belongs to E-UTRA TDD.

Starting from the subframe specified in Section 4.3 of [3] and until the UE has completed the SCell activation, the UE shall send CSI with CQI index = 0 (out of range) if the UE has available uplink resources to report for the SCell.

Upon receiving SCell deactivation command or upon expiry of the *sCellDeactivationTimer* in subframe *n*, the UE shall accomplish the deactivation actions specified in [26] for the SCell being deactivated no later than in subframe *n+8*.

The PCell interruption specified in TS 36.133 [4] section 8.3.3 shall not occur before subframe n+5 and not occur after subframe *n*+9 when PCell belongs to E-UTRA FDD.

The normative reference for this requirement is TS 36.133 [4] clause 7.7.10 and A.8.26.1.

8.26.1.4 Test description

8.26.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.XX as appropriate.

2. The general test parameter settings are set up according to Table 8.26.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.1.4.3.

5. Cell1 is PCell on the primary component carrier and Cell 2 is LAA SCell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test, Cell 2 shall be powered OFF.

Table 8.26.1.4.1-1: General test parameters for known LAA SCell activation case

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Configured deactivated LAA FS3 SCell		Cell 2	Configured deactivated secondary cell on RF channel number 2.
CP length		Normal	
DRX		OFF	Continuous monitoring of primary cell
CQI/PMI periodicity and offset configuration index		0	CQI reporting for SCell every second subframe
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
LBT modelling		[TBD]	Applied for Cell2 as specified in [TBD]
SCell measurement cycle (measCycleSCell)	ms	320	
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset		10	As specified in IE MeasDS-Config in TS 36.331
laa-SCellSubframeConfig		00000000	No MBSFN subframe.
T1	s	7	During this time the PCell shall be known and the SCell configured and detected.
T2	s	> $T_{activate\_basic\_FS3}$	During this time the UE shall activate the SCell, $T_{activate\_basic\_FS3}$ is specified in section 7.7.10.
T3	s	1	During this time the UE shall deactivate the SCell.

8.26.1.4.2 Test procedure

TBD

8.26.1.4.3 Message contents

TBD

8.26.1.5 Test requirement

Table 8.26.1.4.1-1 and Table 8.26.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD activation and deactivation of known LAA SCell in non-DRX test.

Table 8.26.1.5-1: Cell specific test parameters for E-UTRAN FDD known LAA SCell activation

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			20		
PDSCH parameters defined in A.3.1.1.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD			-		
PCFICH/PDCCH/PHICH parameters defined in A.3.1.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			-		
OCNG Patterns defined in A.3.2.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD			OP.14 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104			-104		
$\hat{E}_s/N_{oc}$	dB	17			17		
RSRP Note 3	dBm/15 kHz	-87			-87		
$\hat{E}_s/I_{ot}$ Note 3	dB	17			17		
SCH_RP Note 3	dBm/15 kHz	-87			-87		
Io Note3	dBm/Ch BW	-59.1+10log($N_{RB,c}$ /50)			-56.1		
timing offset to cell1	µs	-			0		
Time alignment error relative to cell 1 Note 5	µs	-			≤ TAE		
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The uplink resources for CSI reporting are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

During T2 the UE shall send the first CSI report for SCell in a subframe (m+8), or in a subframe (m+10) if the suframe (m+8) was subject to interruption. Whether CSI report in subframe (m+8) was interrupted or not is checked by monitoring ACK/NACK sent in PCell in subframe (m+8).

During T2 the UE shall start sending CSI reports for SCell with non-zero CQI index at latest in a subframe [(m+ $T_{activate\_basic\_FS3}$)]ms, *L* is the number of times the discovery signal occasion is not available at the UE during the SCell activation time.

During T3 the UE shall stop sending CSI reports for SCell at latest in a subframe (n+8).

During T2 interruption of PCell during SCell activation shall not happen outside the subframes (m+5) to (m+9).

Figures 8.26.1.5-1 and 8.26.1.5-2 show the deriviation of the Test procedure requreiment for DTX during T2, based on the core requirements for interruption. The applicable figure is selected according to the CA configuration.

NOTE: The differences between activation and deactivation are as follows:

- Activation ➔ Deactivation
- First CSI ➔ Last CSI
- Latest valid CSI report ➔ Not exist (no need to check since CSI report was already stopped)

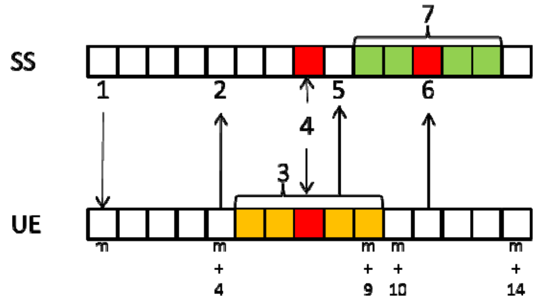

Figure 8.26.1.5-2: Procedure derivation for Activation

1) Activation command for SCell
2) ACK for MAC-CE for SCell activation
3) Possible interruption period by SCell activation
4) Allowed interruption timing (1 subframe in m+5~m+9) on UE by SCell activation,

   That is, possible DTX timing on SS
5) First CSI report timing (could be invalid CQI) at m+8 (might be m+10 due to interruption)
6) Corresponding DTX timing on PUCCH by allowed interruption timing by SCell activation
7) Possible DTX reception period on SS due to interruption by SCell1 activation

During T3 interruption of PCell during SCell deactivation shall not happen outside the subframes (n+5) to (n+9).

The interruption of PCell shall not be more than the values specified for intra-band CA and inter-band CA in Section 7.8.2.

All of the above test requirements shall be fulfilled in order for the observed SCell activation delay and SCell deactivation delay to be counted as correct. The rate of correct observed SCell activation delay and SCell deactivation delay during repeated tests shall be at least 90%.

The statistical pass/ fail decisions are done separately for activation and deactivation.

Decide the test pass, if activation and deactivation are passed, otherwise fail the UE.

8.26.2

8.26.3 Event triggered reporting on LAA deactivated SCell and E-UTRAN FDD PCell interruption in non-DRX

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Message contents are TBD.

- Connection diagrams are TBD

- Test procedures is TBD.

- Annex E updates are pending.

8.26.3.1 Test purpose

To verify that the UE correctly detects event A6 (Neighbour becomes better than SCell) defined in TS 36.331 [2] within the requirements stated in clause 8.3.3.2.1 while at the same time fulfilling the requirement on interruption rate.

8.26.3.2 Test applicability

This test applies to all types of E-UTRA UE FDD release 13 and forward that support LAA. Applicability requires support for IE laa-Parameters-r13.

8.26.3.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1 are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Clause 9.1.17.2.1 are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex B.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8.

applicable requirements in clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in Clause 8.3.3.2.1. When L3 filtering is used or IDC autonomous denial is configured, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in clause 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering, or the UE is configured to perform SRS carrier based switching, is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.26.3.

8.26.3.4 Test description

8.26.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.XX as appropriate.

2. The general test parameter settings are set up according to Table 8.26.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.3.4.3.

5. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.3.4.1-1: General test parameters for Event triggered reporting on LAA deactivated SCell with E-UTRAN FDD PCell interruption in non-DRX

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	Two radio channels are used for this test
Active PCell			Cell 1	Primary cell on RF channel number 1.
Configured deactivated SCell			Cell 2	Configured deactivated secondary cell on RF channel number 2 for frame structure 3.
Neighbour cell			Cell 3	Neighbor cell to be identified on RF channel number 2 for frame structure 3.
CP length			Normal	
DRX			OFF	Continuous monitoring of primary cell
A6	Hysteresis	dB	0	Hysteresis for evaluation of event A6.
	Offset	dB	-3	Offset parameter for evaluation of event A6. Needs to take relative accuracy tolerance in clause 9.1.18.2 into account plus margin.
	Report on leave		False	
	Time To Trigger	s	0	
Discovery signal occasion duration		ms	1	As specified in IE MeasDS-Config in TS 36.331
Filter coefficient			0	L3 filtering is not used
LBT modelling			[TBD]	Applied for cell2 and cell3 as specified in [TBD]
SCell measurement cycle		ms	160	
DMTC period		ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
subframeStartPosition			s0	Discovery signal starts from subframe #0
laa-SCellSubframeConfig			00000000	No MBSFN subframe.
T1		s	5	During this time the UE shall be aware of cells 1 and 2 but not cell 3.
T2		s	≤30+ L* $T_{DMTC\_periodicity}$	UE should report Event A6 within (25.6 + L* $T_{DMTC\_periodicity}$)s (20×scellMeasCycle + time of the discovery signal occasion is not available at the UE during the Event A6 triggered measurement report time)

8.26.3.4.2 Test procedure

TBD

8.26.3.4.3 Message contents

TBD

8.26.3.5 Test requirement

Table 8.26.3.4.1-1 and Table 8.26.3.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD Event triggered reporting on configured but deactivated SCell with PCell interruption in non-DRX test.

Table 8.26.3.5-1: Cell specific test parameters for Event triggered reporting on LAA deactivated SCell with E-UTRAN FDD PCell interruption in non-DRX

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		20		20	
PDSCH parameters defined in A.3.1.1.1		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		-		-	
PCFICH/PDCCH/PHICH parameters defined in A.3.1.2.1		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		-		-	
OCNG Patterns defined in A.3.2.1		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		OP.14 FDD		OP.14 FDD	
IE allowInterruptions		True		-		-	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	13	13	13	13	-Infinity	13
RSRP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
$\hat{E}_s/I_{ot}$ Note 4	dB	13	13	13	-0.21	-Infinity	-0.21
SCH_RP Note 4	dBm/15 kHz	-85	-85	-85	-85	-Infinity	-85
Io Note4	dBm/Ch BW	-57.0+10log($N_{RB,c}$ /50)		-57.0+ 10log ($N_{RB,c}$ /50)	-54.1+ 10log ($N_{RB,c}$ /50)	-57.0+ 10log ($N_{RB,c}$ /50)	-54.1+ 10log ($N_{RB,c}$ /50)
timing offset to cell1	µs	-		0		0	
timing offset to cell2	µs			-		0	
Time alignment error relative to cell 1 Note 5	µs	-		≤ TAE		≤ TAE	
Time alignment error relative to cell 2 Note 5	µs			-		≤ TAE	
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The UE shall send one Event A6 triggered measurement report, with a measurement reporting delay less than [25.6 + L* $T_{DMTC\_periodicity}$] s from the beginning of time period T2, where *L* is the number of times the discovery signal occasion is not available at the UE during the Event A6 triggered measurement report time.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The UE shall be scheduled on PCell continuously throughout the test. From the start of T1 until the measurement report is received during T2, at least 99.5% of all expected ACK/NACKs shall be transmitted by the UE.

For a test to be considered successful requirements on both event detection and percentage of transmitted ACK/NACKs have to be fulfilled simultaneously.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.26.4

8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex E needs to be updated

- Message contents need to be updated.

8.26.5.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in non-DRX requirements in TS 36.133 clause 8.11.2.

8.26.5.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA

8.26.5.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3,}$ where the identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS}$, where:

$T_{identify\_intra\_FS3}$ is the intra-frequency cell identification period as specified in Table 8.26.5.3-1,

$T_{measure\_intra\_FS3\_CRS}$ is the intra-frequency period for measurements as shown in Table 8.26.5.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer,

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_intra\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

The requirements in this section apply, provided that L and M are such that: the intra-frequency cell identification period $T_{identify\_intra\_FS3}$ does not exceed 72*$T_{DMTC\_periodicity}$, and the intra-frequency period $T_{measure\_intra\_FS3\_CRS}$ for measurements does not exceed 60*$T_{DMTC\_periodicity}$.

Table 8.26.5.3-1: Intra-frequency cell identification requirement under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(6+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(24+L) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(2+L) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(8+L) * $T_{DMTC\_periodicity}$
NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.			

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3}$:

- RSRP related side conditions given in TS 36.133 Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.5.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS}$ as shown in Table 8.26.5.3-2, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS}$.

Table 8.26.5.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	(5+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		(20+M) * $T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥ 25	0 ≤ CRS Ês/Iot	(1+M) * $T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥ 25		(4+M) * $T_{DMTC\_periodicity}$
NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ⩾25 RB are optional.			

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1 becomes undetectable for a period ≤ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_intra\_FS3\_CRS}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.5.

8.26.5.4 Test description

8.26.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.5.4.3.
5. Cell 1 is PCell on the FDD primary component carrier (RF Channel 1), Cell 2 is activated SCell on the secondary component carrier (RF Channel 2) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.5.4.1-1: General test parameters for E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
LBT modelling			Applied for Cell3 as specified in TS 36.133 A.3.17
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	5	

8.26.5.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.5.4.3.
4. Set the parameters according to T1 in Table 8.26.5.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 and A2 configured.
6. The UE shall transmit an RRCConnectionReconfigurationComplete message.
7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.5.5-1.
8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 962+L*40 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell3, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.
9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.
11. After the RRC connection release, the SS:
    - transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
    or
    - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
12. Repeat step 3-11 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

FFS.

8.26.5.5 Test requirement

Table 8.26.5.4.1-1 and Table 8.26.5.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.5.5-1: Cell specific test parameters for E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz: 47-52		47-52		47-52	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.7 FDD 10MHz: R.3 FDD 20MHz: R.6 FDD		R.0 FS3		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.20 FDD 10MHz: OP.10 FDD 20MHz: OP.17 FDD		OP.8 TDD		OP.8 TDD	
PBCH_RA	dB	0					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104		-104			
$\hat{E}_s/N_{oc}$	dB	4	4	4	4	-infinity	4
$\hat{E}_s/I_{ot}$	dB	4	4	4	-1.455	-infinity	-1.455
RSRP Note 3	dBm/15 kHz	-100	-100	-100	-100	-infinity	-100
SCH_RP Note 3	dBm/15 kHz	-100	-100	-100	-100	-infinity	-100
Io Note 3	dBm/Ch BW	-70.76+10log ($N_{RB,c}$ /50)	-70.76+10log ($N_{RB,c}$ /50)	-67.75	-65.41	-67.75	-65.41
Propagation Condition		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3
Time alignment error relative to cell 1 Note 5	µs	-	-	N/A	≤ TAE	N/A	≤ TAE

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP SCH_RP and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to 2×TTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Where:

measurement reporting delay = $T_{identify\_intra\_FS3}$

$T_{identify\_intra\_FS3}$ = (24+L) * $T_{DMTC\_periodicity}$

$T_{DMTC\_periodicity}$ = 40 ms

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = 2xTTI_{DCCH} = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 962+L*40 ms from the beginning of time T2 (note: this gives a total of 960+L*40 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Annex E needs to be updated

- Message contents need to be updated.

8.26.6.1 Test purpose

The purpose of the test is to verify that the UE makes correct reporting of an event under operation with frame structure 3. The test will partly verify new intra-frequency FS3 cells in non-DRX requirements in TS 36.133 clause 8.11.2.

8.26.6.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA

8.26.6.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable FS3 intra-frequency cell within the cell identification time $T_{identify\_intra\_FS3}$, where the identification time of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{measure\_intra\_FS3\_CRS}$, where:

$T_{identify\_intra\_FS3}$ is the intra-frequency cell identification period as specified in Table 8.26.6.3-1,

$T_{measure\_intra\_FS3\_CRS}$ is the intra-frequency period for measurements as shown in Table 8.26.6.3-2,

$T_{DMTC\_periodicity}$ is the discovery signal measurement timing configuration periodicity of higher layer, L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe,

M is the number of configured discovery signal occasions which are not available during $T_{measure\_intra\_FS3\_CRS}$ for the measurements at the UE due to the absence of the necessary radio signals from the cell or due to the corresponding downlink subframe being configured as an uplink subframe.

The requirements in this section apply, provided that L and M are such that: the intra-frequency cell identification period $T_{identify\_intra\_FS3}$ does not exceed $72*T_{DMTC\_periodicity}$, and the intra-frequency period $T_{measure\_intra\_FS3\_CRS}$ for measurements does not exceed $60*T_{DMTC\_periodicity}$.

Table 8.26.6.3-1: Intra-frequency cell identification requirement under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{identify\_intra\_FS3}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	$(6+L) * T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		$(24+L) * T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	$(2+L) * T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥25		$(8+L) * T_{DMTC\_periodicity}$
NOTE 1 : Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.			

A cell shall be considered detectable when the following conditions are met during the discovery signal occasions which are available during $T_{identify\_intra\_FS3}$:

- RSRP related side conditions given in TS 36.133 Section 9.1.18.2 are fulfilled for a corresponding Band,
- RSRQ related side conditions given in TS 36.133 Section 9.1.18.3 are fulfilled for a corresponding Band,
- SCH_RP is according to TS 36.133 Annex B.2.12 for a corresponding Band and SCH Ês/Iot is according to Table 8.26.6.3-1.

If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is $T_{measure\_intra\_FS3\_CRS}$ as shown in Table 8.26.6.3-2, when no DRX is in use. The UE shall be capable of performing RSRP and RSRQ measurements for 3 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers within the measurement period of $T_{measure\_intra\_FS3\_CRS}$.

Table 8.26.6.3-2: Intra-frequency measurement requirements under operation with frame structure 3

SCH Ês/Iot	CRS measurement bandwidth [RB] Note2	CRS Ês/Iot	$T_{measure\_intra\_FS3\_CRS}$ [ms]
0 ≤ SCH Ês/Iot	<25	-6 ≤ CRS Ês/Iot	$(5+M) * T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	<25		$(20+M) * T_{DMTC\_periodicity}$
0 ≤ SCH Ês/Iot	≥25	0 ≤ CRS Ês/Iot	$(1+M) * T_{DMTC\_periodicity}$
-6 ≤ SCH Ês/Iot < 0	≥25		$(4+M) * T_{DMTC\_periodicity}$
NOTE 1: Discovery signal occasion duration (*ds-OccasionDuration*) is 1 ms. NOTE 2: The requirements for measurement bandwidth ≥25 RB are optional.			

The RSRP measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.2, and the RSRQ measurement accuracy for all measured cells shall be as specified in TS 36.133 Section 9.1.18.3.

Reported RSRP and RSRQ measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 Sections 9.1.18.2 and 9.1.18.3, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report or by the LBT procedure performed by the UE in order to determine that the channel is clear for performing uplink transmission.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra\_FS3}$ defined in TS 36.133 Section 8.11.2.1.1.1 becomes undetectable for a period $\leq$ 8 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{identify\_intra\_FS3\_CRS}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used or IDC autonomous denial is configured or LBT is performed by the UE on the carrier used for the measurement reporting, an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.11.2 and A.8.26.6.

8.26.6.4 Test description

8.26.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. The general test parameter settings are set up according to Table 8.26.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 8.26.6.4.3.
5. Cell 1 is PCell on the TDD primary component carrier (RF Channel 1), Cell 2 is activated SCell on the secondary component carrier (RF Channel 2) for Frame Structure 3, and Cell 3 is the neighbour cell on the secondary component carrier (RF Channel 2) frame structure 3. LBT model is applied on cell 3. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test, Cell 2 and Cell 3 shall be powered OFF.

Table 8.26.6.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	Primary cell on RF channel number 1.
Active SCell		Cell 2	Configured activated secondary cell on RF channel number 2.
Neighbour cell		Cell 3	Neighbor cell to be identified on RF channel number 2.
DMTC period	ms	40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset	ms	10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration	ms	1	As specified in IE MeasDS-Config in TS 36.331
LBT modelling			Applied for Cell3 as specified in TS 36.133 A.3.17
CP length		Normal	
A6-Offset	dB	-6	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
T1	s	5	
T2	s	5	

8.26.6.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 3. Immediately at beginning of T2 the transmission power of cell 3 is increased, and due to usage of an offset this shall result in reporting of Event A6.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0, C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4 with the message content exceptions defined in clause 8.26.6.4.3.

4. Set the parameters according to T1 in Table 8.26.6.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

5. After 2s from start of T1, SS shall transmit an RRCConnectionReconfiguration message with events A6 configured.

6. The UE shall transmit an RRCConnectionReconfigurationComplete message.

7. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.6.5-1.

8. The UE shall transmit a MeasurementReport message triggered by Event A6. If the measurement reporting delay from the beginning of time period T2 is less than 962+L*40 ms, where L is the number of configured discovery signal occasions which are not available due to the absence of the necessary radio signals from cell3, then count a success for the event “A6”. Otherwise count a fail for the event “A6”.

9. After the SS receives the MeasurementReport message in step 8) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

10. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. If physical cell identity of Cell 3 = physical cell identity of Cell 2 then skip this physical cell identity value for Cell 3.

11. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

12. Repeat step 3-11 until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8.26.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

FFS.

8.26.6.5 Test requirement

Table 8.26.6.4.1-1 and Table 8.26.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3.

Table 8.26.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal measurement under Operation with Frame Structure 3

Parameter	Unit	Cell1		Cell2		Cell3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		2	
Special subframe configuration		6		-		-	
Uplink-downlink configuration		1		-		-	
$BW_{channel}$	MHz	5MHz: NRB,c = 25 10MHz: NRB,c = 50 20MHz: NRB,c = 100		20		20	
Measurement bandwidth	n_{PRB}	5MHz:18-24 10MHz:13-37 20MHz: 47-52		38-62		38-62	
PDSCH parameters: DL Reference Measurement Channel		5MHz: R.5 TDD 10MHz: R.0 TDD 20MHz: R.4 TDD		R.0 FS3		-	
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement Channel		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.0 FS3		R.0 FS3	
OCNG Patterns		5MHz: OP.15 TDD 10MHz: OP.1 TDD 20MHz: OP.11 TDD		OP.8 TDD		OP.8 TDD	
PBCH_RA	dB	0					
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 2	dBm/15 kHz	-104		-104			
$\hat{E}_s/N_{oc}$	dB	4	4	4	4	-infinity	4
$\hat{E}_s/I_{ot}$	dB	4	4	4	-1.455	-infinity	-1.455
RSRP Note 3	dBm/15 kHz	-100	-100	-100	-100	-infinity	-100
SCH_RP Note 3	dBm/15 kHz	-100	-100	-100	-100	-infinity	-100
Io Note 3	dBm/Ch BW	-70.76+10log($N_{RB,c}$/50)	-70.76+10log($N_{RB,c}$/50)	-67.75	-65.41	-67.75	-65.41
Propagation Condition		ETU30		ETU30		ETU30	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low		1x2 Low	
Timing offset to Cell 1	µs	-	-	0	0	-	3
Time alignment error relative to cell 1 Note 5	µs	-	-	N/A	≤ TAE	N/A	≤ TAE
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP SCH_RP and Es/Iot levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 5:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

The actual overall delays measured in the tests may be up to $2\times TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra\_FS3}$.

The overall delays measured test requirement for Event A6 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty.

Where:

measurement reporting delay = $T_{identify\_intra\_FS3}$

$T_{identify\_intra\_FS3} = (24+L) * T_{DMTC\_periodicity}$

$T_{DMTC\_periodicity} = 40$ ms

L is the number of configured discovery signal occasions which are not available during $T_{identify\_intra\_FS3}$ for cell identification at the UE due to the absence of the necessary radio signals from the cell

TTI insertion uncertainty = $2xTTI_{DCCH}$ = 2 ms

The UE shall send one Event A6 triggered measurement report with a measurement reporting delay of less than 962+L*40 ms from the beginning of time T2 (note: this gives a total of 960+L*40 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.7 to 8.26.8

8.26.9 E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- RSRP threshold within brackets in general test parameter table

- Duration of timer T2 is TBD in general test parameter table

- Signal levels in cell specific parameter table are within brackets.

-The test requirement is TBD, reflected also in test procedure step 6.

- Test Tolerance is TBD

- Test system uncertainties is TBD

8.26.9.1 Test purpose

To verify the UE's ability to make a correct reporting of a event A4 under fading propagation conditions in synchronous cells within the E-UTRA FDD – Frame Structure 3 inter-frequency cell search requirements. This test will verify the FDD-FS3 inter-frequency cell search requirements in section 8.3.3.2.1.

8.26.9.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and FS3 release 13 and forward. Applicability requires support for FGI bit 25.

8.26.9.3 Minimum conformance requirements

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [5].

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1 in TS36.133[4] are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1 in TS36.133[4] are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Clause 9.1.17.2.1 in TS36.133[4] are fulfilled for a corresponding Band,
- $SCH\_RP|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 in TS36.133[4] (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8 in TS36.133[4].

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the applicable requirements in clause 9 in TS36.133[4].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in Clause 8.3.3.2.1 in TS36.133[4]. When L3 filtering is used or IDC autonomous denial is configured, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in clause 8.3.3.2.1 in TS36.133[4] becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering, or the UE is configured to perform SRS carrier based switching, is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.26.9.

8.26.9.4 Test description

8.26.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders but not the AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.26.9.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.9.4.3.

5. There are two E-UTRA carriers and one E-UTRA FDD Cell 1 and one E-UTRA FS3 TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.26.9.4.1-1: General test parameters for E-UTRAN FDD-FS3 inter-frequency event triggered reporting in fading propagation conditions

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One FDD carrier frequency is used for active cell and one FS3 carrier frequency is used for neighbour cell.
Active cell			Cell 1	Cell 1 is on RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on RF channel number 2
DMTC period			40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration			1	As specified in IE MeasDS-Config in TS 36.331
Gap Pattern Id			0	As specified in TS 36.133 clause 8.1.2.1.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	[-105]	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	OFF
Time offset between cells			0 ms	Synchronous cells
T1		s	5	
T2		s	TBD	

8.26.9.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #0is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.26.9.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.9.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A4. If the measurement reporting delay from the beginning of time period T2 is less than TBD ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
   - transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
   or
   - switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.9.4.3-1: Common Exception messages for Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H.3.1-7

Table 8.26.9.4.3-2: *MeasConfigEUTRA-A4*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {		f1 is the frequency of the serving cell	
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A4		
reportConfig	ReportConfigEUTRA-A4		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A4		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.26.9.4.3-3: *ReportConfigEUTRA-A4*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6AA ReportConfigEUTRA-A4(Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA4 SEQUENCE {			
a4-Threshold CHOICE{			
threshold-RSRP	35 (-105)	-105 is actual threshold value in dBm	Not RSRQ
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.26.9.4.3-4: *MeasResults*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.26.9.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.26.9.5 Test requirement

Tables 8.26.9.4.1-1 and 8.26.9.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous FDD-FS3 inter frequency cells test.

Table 8.26.9.5-1: Cell specific test parameters for E-UTRAN FDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
Frame Structure		FDD		FS3	
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	5 MHz: $N_{RB,c}$ = 25 10 MHz: $N_{RB,c}$ = 50 20 MHz: $N_{RB,c}$ = 100		20 MHz: $N_{RB,c}$ = 100	
Uplink-downlink configuration		-		Note 5	
LBT model		-		A.3.17	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
PDSCH Reference measurement channel defined in A.3.1.1.1 (R.6 FDD) and A.3.1.1.6 (R.0 FS3)		5 MHz: R.5 FDD 10 MHz: R.0 FDD 20 MHz: R.4 FDD		R.0 FS3	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1 (R.6 FDD, R.10 FDD, R.11 FDD) and A.3.1.2.3 (R.0 FS3)		5 MHz: R.11 FDD 10 MHz: R.6 FDD 20 MHz: R.10 FDD		R.0 FS3	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD), A.3.2.1.15 (OP.15 FDD), A.3.2.1.11 (OP.11 FDD) and A.3.2.2.7 (OP.7 TDD)		5 MHz: OP.15 FDD 10 MHz: OP.1 FDD 20 MHz: OP.11 FDD		OP.7 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	[-98+TT]		[-98+TT]	
RSRP Note 4	dBm/15 kHz	[-94+TT]	[-94+TT]	-inf	[-91+TT]
$\hat{E}_s/I_{ot}$	dB	[4+TT]	[4+TT]	-inf	[7+TT]
SCH_RP Note 4	dBm/15 kHz	[-94+TT]	[-94+TT]	-inf	[-91+TT]
$\hat{E}_s/N_{oc}$	dB	[4+TT]	[4+TT]	-inf	[7+TT]
Io	dBm/Ch BW	[-64.76] +10log ($N_{RB,c}$ /50)	[-64.76] +10log ($N_{RB,c}$ /50)	[-70.22]	[-62.43]
Propagation Condition		ETU30		ETU30	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	Downlink only configuration.

The UE shall send one Event A4 triggered measurement report, with a measurement reporting delay less than TBD ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A4 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = TBD ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of TBD+2 ms in this test case (note: a total of TBD ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

8.26.10 E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- RSRP threshold within brackets in general test parameter table

- Duration of timer T2 is TBD in general test parameter table

- Signal levels in cell specific parameter table are within brackets.

-The test requirement is TBD, reflected also in test procedure step 6.

- Test Tolerance is TBD

- Test system uncertainties is TBD

8.26.10.1 Test purpose

To verify the UE’s ability to make a correct reporting of a event A4 under fading propagation conditions in synchronous cells within the E-UTRA TDD – Frame Structure 3 inter-frequency cell search requirements. This test will verify the TDD-FS3 inter-frequency cell search requirements in section 8.3.3.2.1.

8.26.10.2 Test applicability

This test applies to all types of E-UTRA UE supporting TDD and FS3 release 13 and forward. Applicability requires support for FGI bit 25.

8.26.10.3 Minimum conformance requirements

This clause defines the measurement requirements of a secondary component carrier with deactivated SCell based on the parameter *measCycleSCell* defined in TS 36.331 [5].

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on a secondary component carrier within $T_{identify\_scc}$, according to the parameter *measCycleSCell* where $T_{identify\_scc}$ = 20 *measCycleSCell*

A cell shall be considered detectable when

- RSRP related side conditions given in Clause 9.1 in TS36.133[4] are fulfilled for a corresponding Band,
- RSRQ related side conditions given in Clause 9.1 in TS36.133[4] are fulfilled for a corresponding Band,
- RS-SINR related side conditions given in Clause 9.1.17.2.1 in TS36.133[4] are fulfilled for a corresponding Band,
- SCH_RP$|_{dBm}$ and SCH Ês/Iot according to Annex I.2.7 for a corresponding Band.

The measurement period for deactivated scell measurements is $T_{measure\_scc}$ according to the parameter *measCycleSCell* where $T_{measure\_scc}$ = 5 *measCycleSCell*. The UE shall be capable of performing RSRP, RSRQ, and RS-SINR measurements for 8 identified cells on a secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 in TS36.133[4] (Carrier aggregation measurement accuracy)

A UE may reconfigure the receiver bandwidth or turn on/off one of the RF chains when performing measurements on up to four SCCs with deactivated SCell. This may cause interruptions on PCell or activated SCell(s) or both that are specified in Section 7.8 in TS36.133[4].

Reported RSRP, RSRQ, and RS-SINR measurements contained in event triggered measurement reports shall meet the applicable requirements in clause 9 in TS36.133[4].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which is caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_scc}$ defined in Clause 8.3.3.2.1 in TS36.133[4]. When L3 filtering is used or IDC autonomous denial is configured, or the UE is configured to perform SRS carrier based switching, an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_scc}$ defined in clause 8.3.3.2.1 in TS36.133[4] becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure\_scc}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering, or the UE is configured to perform SRS carrier based switching, is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.3.3.2.1 and A.8.26.10.

8.26.10.4 Test description

8.26.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders but not the AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.26.10.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.26.10.4.3.

5. There are two E-UTRA carriers and one E-UTRA TDD Cell 1 and one E-UTRA FS3 TDD Cell 2 on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.26.10.4.1-1: General test parameters for E-UTRAN TDD-FS3 inter-frequency event triggered reporting in fading propagation conditions

Parameter		Unit	Value	Comment
E-UTRA RF Channel Number			1, 2	One TDD carrier frequency is used for active cell and one FS3 carrier frequency is used for neighbour cell.
Active cell			Cell 1	Cell 1 is on RF channel number 1
Neighbour cell			Cell 2	Cell 2 is on RF channel number 2
DMTC period			40	As specified in IE MeasDS-Config in TS 36.331
dmtc-PeriodOffset			10	As specified in IE MeasDS-Config in TS 36.331
Discovery signal occasion duration			1	As specified in IE MeasDS-Config in TS 36.331
Gap Pattern Id			0	As specified in TS 36.133 clause 8.1.2.1.
A4	Hysteresis	dB	0	Hysteresis for evaluation of event A4.
	Threshold RSRP	dBm	[-105]	Actual RSRP threshold for event A4. Needs to take absolute accuracy tolerance in section 9.1.11.1 into account plus margin.
	Time To Trigger	s	0	
CP length			Normal	
TimeToTrigger		s	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	OFF
Time offset between cells			0 ms	Synchronous cells
T1		s	5	
T2		s	TBD	

8.26.10.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration #0is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to T1 in Table 8.26.10.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.26.10.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A4. If the measurement reporting delay from the beginning of time period T2 is less than TBD ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS:
- transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A (if the paging fails, switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3),
or
- switches off and on the UE and ensures the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.26.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.26.10.4.3-1: Common Exception messages for Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H.3.1-7

Table 8.26.10.4.3-2: *MeasConfigEUTRA-A4*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {		f1 is the frequency of the serving cell	
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A4		
reportConfig	ReportConfigEUTRA-A4		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A4		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.26.10.4.3-3: *ReportConfigEUTRA-A4*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6AA ReportConfigEUTRA-A4(Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA4 SEQUENCE {			
a4-Threshold CHOICE{			
threshold-RSRP	35 (-105)	-105 is actual threshold value in dBm	Not RSRQ
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.26.10.4.3-4: *MeasResults*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.26.10.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.26.10.5 Test requirement

Tables 8.26.10.4.1-1 and 8.26.10.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous TDD-FS3 inter frequency cells test.

Table 8.26.10.5-1: Cell specific test parameters for E-UTRAN TDD-FS3 inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
Frame Structure		TDD		FS3	
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	5 MHz: $N_{RB,c}$ = 25 10 MHz: $N_{RB,c}$ = 50 20 MHz:$N_{RB,c}$ = 100		20 MHz:$N_{RB,c}$ = 100	
Special subframe configuration		6		Note 5	
Uplink-downlink configuration		1		Note 5	
LBT model		-		A.3.17	
Correlation Matrix and Antenna Configuration		1x2 Low		1x2 Low	
PDSCH Reference measurement channel defined in A.3.1.1.2 (R.3 TDD) and A.3.1.1.6 (R.0 FS3)		R.3 TDD		R.0 FS3	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2 (R.6 TDD, R.10 TDD, R.11 TDD) and A.3.1.2.3 (R.0 FS3)		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD		R.0 FS3	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) , A.3.2.2.9 (OP.9 TDD) and A.3.2.2.7 (OP.7 TDD)		5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD		OP.7 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	[-98+TT]		[-98+TT]	
RSRP Note 4	dBm/15 kHz	[-94+TT]	[-94+TT]	-inf+TT	[-91+TT]
$\hat{E}_s/I_{ot}$	dB	[4+TT]	[4+TT]	-inf+TT	[7+TT]
SCH_RP Note 4	dBm/15 kHz	[-94+TT]	[-94+TT]	-inf+TT	[-91+TT]
$\hat{E}_s/N_{oc}$	dB	[4+TT]	[4+TT]	-inf+TT	[7+TT]
Io	dBm/Ch BW	[-64.76] +10log ($N_{RB,c}$ /50)	[-64.76] +10log ($N_{RB,c}$ /50)	[-70.22]	[-62.43]
Propagation Condition		ETU30		ETU30	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	Downlink only configuration

The UE shall send one Event A4 triggered measurement report, with a measurement reporting delay less than TBD ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A4 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = TBD ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of TBD+2 ms in this test case (note: a total of TBD ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

9 Measurement Performance Requirements

When the UE is in RRC_CONNECTED state on a cell, physical layer measurements as defined in TS 36.214 [12] clause 5 are initiated and reported to higher layers. To initiate a specific measurement, the System Simulator sends a 'RRC Connection Reconfiguration message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), the physical layer measurement process takes place. In this process when the reporting criteria are fulfilled the UE sends a 'Measurement Report message' to the System Simulator including the measurement ID and the results. The reporting criteria that trigger the UE to send a 'Measurement Report message' to the System Simulator is periodical as defined in TS 36.331 [5] clause 5.5.4. The physical layer measurements succeed only if the performance results in terms of accuracy are within the specified limits.

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band.

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions and assume independent interference (noise) at each receiver antenna port.

The reported measurement results after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period.

The accuracy requirements are valid for the reported measurement results after layer 1 filtering.

Unless explicitly stated:

- In state RRC_CONNECTED
- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is as defined in Annex A. This measurement channel is used both in active cell and cells to be measured.
- The reference channels assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.
- SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.
- Uplink is configured according to Annex A.3.
- Propagation condition is AWGN as defined in Annex B.
- Physical channels used as defined in Annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

NOTE: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.

9.1 RSRP

9.1.1 FDD Intra frequency RSRP Accuracy

9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy

9.1.1.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11. Applicability requires support for FGI bit 16.

9.1.1.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.1.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.1.1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.1.

9.1.1.1.4 Test description

9.1.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.1.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.1.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.1.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.1.1.5-2 as appropriate.

9.1.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.1.5 Test requirement

Table 9.1.1.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1.5-3.

Table 9.1.1.1.5-1: Void

Table 9.1.1.1.5-2: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	115.0						115.5	
	Bands FDD_C						-115.0	
	Bands FDD_D						-114.5	
	Bands FDD_E Note 5, FDD_F						-114.0	
	Bands FDD_G						-113.0	
	Bands FDD_H						-112.5	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113.0	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112.0	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F Note 5						-111.0	-114.2
	Bands FDD_G						-110.0	-113.2
	Bands FDD_H						-109.5	-112.7
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 5						-80.25	
	Bands FDD_G						-79.25	
	Bands FDD_H						-78.75	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.1.5-3: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_28	RSRP_45	Bands FDD_A	RSRP_17
			Bands FDD_B	RSRP_17
			Bands FDD_C	RSRP_18
			Bands FDD_D	RSRP_18
			Bands FDD_E, FDD_F	RSRP_19
			Bands FDD_G	RSRP_20
			Bands FDD_H	RSRP_20
Highest reported value (Cell 2)	RSRP_43	RSRP_64	Bands FDD_A	RSRP_32
			Bands FDD_B	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_D	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands FDD_A	RSRP_14
			Bands FDD_B	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands FDD_A	RSRP_35
			Bands FDD_B	RSRP_35
			Bands FDD_C	RSRP_36
			Bands FDD_D	RSRP_36
			Bands FDD_E, FDD_F	RSRP_37
			Bands FDD_G	RSRP_38
			Bands FDD_H	RSRP_38
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.1.1_1.1 Test purpose

Same test purpose as in clause 9.1.1.1.1.

9.1.1.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.1.1.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.1.1.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.1.1_1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.1.

9.1.1.1_1.4 Test description

9.1.1.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.1.1.4.1 with the following exceptions:

- Instead of 9.1.1.1.4.3 → use 9.1.1.1_1.4.3.

9.1.1.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.1.1.4.2 with the following exceptions:

- Instead of Table 9.1.1.1.5-2 → use Table 9.1.1.1_1.5-1.
- Instead of Table 9.1.1.1.5-3 → use Table 9.1.1.1_1.5-2.

9.1.1.1_1.4.3 Message contents

Same message contents as in clause 9.1.1.1.4.3.

9.1.1.1_1.5 Test requirement

Table 9.1.1.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1_1.5-2.

Table 9.1.1.1_1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands FDD_B						115.5	
	Bands FDD_C						-115.0	
	Bands FDD_D						-114.5	
	Bands FDD_E FDD_F Note 5						-114.0	
	Bands FDD_G						-113.0	
	Bands FDD_H						-112.5	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113.0	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112.0	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F Note 5						-111.0	-114.2
	Bands FDD_G						-110.0	-113.2
	Bands FDD_H						-109.5	-112.7
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 5						-80.25	
	Bands FDD_G						-79.25	
	Bands FDD_H						-78.75	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

NOTE 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
NOTE 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.1_1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_29	RSRP_45	Bands FDD_A	RSRP_18
			Bands FDD_B	RSRP_19
			Bands FDD_C	RSRP_19
			Bands FDD_D	RSRP_20
			Bands FDD_E, FDD_F	RSRP_20
			Bands FDD_G	RSRP_21
			Bands FDD_H	RSRP_22
Highest reported value (Cell 2)	RSRP_42	RSRP_64	Bands FDD_A	RSRP_30
			Bands FDD_B	RSRP_31
			Bands FDD_C	RSRP_31
			Bands FDD_D	RSRP_32
			Bands FDD_E, FDD_F	RSRP_32
			Bands FDD_G	RSRP_33
			Bands FDD_D	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands FDD_A	RSRP_14
			Bands FDD_B	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands FDD_A	RSRP_35
			Bands FDD_B	RSRP_35
			Bands FDD_C	RSRP_36
			Bands FDD_D	RSRP_36
			Bands FDD_E, FDD_F	RSRP_37
			Bands FDD_G	RSRP_38
			Bands FDD_H	RSRP_38
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP

9.1.1.2.1 Test purpose

To verify that the FDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.1.1.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in table 9.1.1.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.1.2.3-1: RSRP FDD Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.1.

9.1.1.2.4 Test description

9.1.1.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.1.2.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.1.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.1.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.1.2.5-2 as appropriate.

9.1.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.2.4.3-2: *MeasResults*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.2.5 Test requirement

Table 9.1.1.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.1.2.5-3.

Table 9.1.1.2.5-1: Void

Table 9.1.1.2.5-2: RSRP FDD Intra frequency relative accuracy test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106.00	-106.00	-88.00	-88.00	-116.00	
	Bands FDD_B						-115.50	
	Bands FDD_E, FDD_F Note 5						-114.00	
	Bands FDD_H						-112.50	
	Bands FDD_D						-114.50	
	Bands FDD_G						-113.00	
	Bands FDD_C						-115.00	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-100.00	-104.00	-82.00	-86.00	-113.00	-116.00
	Bands FDD_B						-112.50	-115.50
	Bands FDD_E, FDD_F Note 5						-111.00	-114.00
	Bands FDD_H						-109.50	-112.50
	Bands FDD_D						-111.50	-114.50
	Bands FDD_G						-110.00	-113.00
	Bands FDD_C						-112.00	-115.00
Io Note3	Bands FDD_A	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
	Bands FDD_B						-81.70	
	Bands FDD_E, FDD_F Note 5						-80.20	
	Bands FDD_H						-78.70	
	Bands FDD_D						-80.70	
	Bands FDD_G						-79.20	
	Bands FDD_C						-81.20	
$\hat{E}_s/N_{oc}$		dB	6.00	2.00	6.00	2.00	3.00	0.00
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.1.2.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2 TDD Intra frequency RSRP Accuracy

9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy

9.1.2.1.1 Test purpose

To verify that the TDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bit 16.

9.1.2.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.2.1.3-1: RSRP TDD Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.2.

9.1.2.1.4 Test description

9.1.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.2.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.2.1.5-3.

7 If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.2.1.5-2 as appropriate.

9.1.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.1.4.3-1: Common Exception message for RSRP TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.1.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

9.1.2.1.5 Test requirement

Table 9.1.2.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.2.1.5-3.

Table 9.1.2.1.5-1: Void

Table 9.1.2.1.5-2: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands TDD_C						-115.0	
	Bands TDD_E						-114.0	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113	-116.2
	Bands TDD_C						-112	-115.2
	Bands TDD_E						-111	-114.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.20
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.1.5-3: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_28	RSRP_45	Bands TDD_A	RSRP_17
			Bands TDD_C	RSRP_18
			Bands TDD_E	RSRP_19
Highest reported value (Cell 2)	RSRP_43	RSRP_64	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands TDD_A	RSRP_35
			Bands TDD_C	RSRP_36
			Bands TDD_E	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.2.1_1.1 Test purpose

Same test purpose as in clause 9.1.2.1.1.

9.1.2.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.1.2.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.2.1_1.3-1: RSRP TDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, GDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1_1, clause 9.1.4 and A.9.1.2.

9.1.2.1_1.4 Test description

9.1.2.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.2.1.4.1 with the following exceptions:

- Instead of 9.1.2.1.4.3 → use 9.1.2.1_1.4.3.

9.1.2.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.2.1.4.2 with the following exceptions:

- Instead of Table 9.1.2.1.5-2 → use Table 9.1.2.1_1.5-1.
- Instead of Table 9.1.2.1.5-3 → use Table 9.1.2.1_1.5-2.

9.1.2.1_1.4.3 Message contents

Same message contents as in clause 9.1.2.1.4.3

9.1.2.1_1.5 Test requirement

Table 9.1.2.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.2.1_1.5-2.

Table 9.1.2.1_1.5-1: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-107.0		-88.0		-116.0	
	Bands TDD_C						-115.0	
	Bands TDD_E						-114.0	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101.0	-105.0	-82.0	-86.0	-113	-116.2
	Bands TDD_C						-112	-115.2
	Bands TDD_E						-111	-114.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-52.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.20
Propagation condition		-	AWGN		AWGN		AWGN	

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.1_1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_29	RSRP_45	Bands TDD_A	RSRP_18
			Bands TDD_C	RSRP_19
			Bands TDD_E	RSRP_20
Highest reported value (Cell 2)	RSRP_42	RSRP_64	Bands TDD_A	RSRP_30
			Bands TDD_C	RSRP_31
			Bands TDD_E	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_42	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_46	RSRP_67	Bands TDD_A	RSRP_35
			Bands TDD_C	RSRP_36
			Bands TDD_E	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.2 TDD Intra Frequency Relative Accuracy of RSRP

9.1.2.2.1 Test purpose

To verify that the TDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.1.2.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.2.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.2.2.3-1: RSRP TDD Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.2.

9.1.2.2.4 Test description

9.1.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.2.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.2.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP measurement value for Cell 2 is compared to the reported RSRP measurement value for Cell 1 for each MeasurementReport message according to Table 9.1.2.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.2.2.5-2 as appropriate.

9.1.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.2.4.3-1: Common Exception messages for RSRP TDD intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.2.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	physCellId of Cell2		
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.2.2.5 Test requirement

Table 9.1.2.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.2.2.5-3. The mapping of measured quantity is defined in Table 9.1.2.2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.2.5-1: Void

Table 9.1.2.2.5-2: RSRP TDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-106.0	-106.0	-88.0	-88.0	-116.0	
	Bands TDD_C						-115.00	
	Bands TDD_E						-114.00	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-100.0	-104.0	-82.0	-86.0	-113.0	-116.0
	Bands TDD_C						-112.00	-115.00
	Bands TDD_E						-111.00	-114.00
Io[Note4]	Bands TDD_A	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
	Bands TDD_C						-81.20	
	Bands TDD_E						-80.20	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	0.0
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.2.2.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3		
	All bands	All bands	Bands 33, 34, 35, 36, 37, 38, 39, 40	Band 42, 43, 48	Band 41
Normal Conditions					
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8	RSRP_x - 8	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2
Extreme Conditions					
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8	RSRP_x - 8	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2	RSRP_x + 2	RSRP_x + 2
RSRP_x is the reported value of Cell 1					

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3 FDD Inter frequency RSRP Accuracy

9.1.3.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy

9.1.3.1.1 Test purpose

To verify that the FDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.3.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.3.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.3.1.3-1: RSRP FDD Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.3.

9.1.3.1.4 Test description

9.1.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.3.1.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.3.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.3.1.5-3.

If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.3.1.5-2 as appropriate.

9.1.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.1.4.3-1: Common Exception messages for RSRP FDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.1.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.1.5 Test requirement

Table 9.1.3.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.3.1.5-3.

Table 9.1.3.1.5-1: Void

Table 9.1.3.1.5-2: RSRP FDD - FDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands FDD_B					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.1.5-3: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Bands FDD_A	RSRP_13
		Bands FDD_B	RSRP_13
		Bands FDD_C	RSRP_14
		Bands FDD_D	RSRP_14
		Bands FDD_E, FDD_F	RSRP_15
		Bands FDD_G	RSRP_16
		Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_71	Bands FDD_A	RSRP_28
		Bands FDD_B	RSRP_28
		Bands FDD_C	RSRP_29
		Bands FDD_D	RSRP_29
		Bands FDD_E, FDD_F	RSRP_30
		Bands FDD_G	RSRP_31
		Bands FDD_H	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands FDD_A	RSRP_10
		Bands FDD_B	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	RSRP_74	Bands FDD_A	RSRP_31
		Bands FDD_B	RSRP_31
		Bands FDD_C	RSRP_32
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_33
		Bands FDD_G	RSRP_34
		Bands FDD_H	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.1_1 FDD - FDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.3.1_1.1 Test purpose

Same test purpose as in clause 9.1.3.1.1

9.1.3.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.3.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.3.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.3.1_1.3-1: RSRP FDD Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1_1, clause 9.1.4 and A.9.1.3.

9.1.3.1_1.4 Test description

9.1.3.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.3.1.4.1 with the following exceptions:

- Instead of 9.1.3.1.4.3 → use 9.1.3.1_1.4.3.

9.1.3.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.3.1.4.2 with the following exceptions:

- Instead of Table 9.1.3.1.5-2 → use Table 9.1.3.1_1.5-1.
- Instead of Table 9.1.3.1.5-3 → use Table 9.1.3.1_1.5-2.

9.1.3.1_1.4.3 Message contents

Same message contents as in clause 9.1.3.1.4.3

9.1.3.1_1.5 Test requirement

Table 9.1.3.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.3.1_1.5-2.

Table 9.1.3.1_1.5-1: RSRP FDD - FDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands FDD_B					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands FDD_B					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands FDD_B					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02

$\hat{E}_s/N_{oc}$	dB	10	10	13	-3.2
Propagation condition	-	AWGN		AWGN	
NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. NOTE 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.					

Table 9.1.3.1_1.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_52	Bands FDD_A	RSRP_14
		Bands FDD_B	RSRP_15
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_16
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_18
Highest reported value (Cell 2)	RSRP_71	Bands FDD_A	RSRP_26
		Bands FDD_B	RSRP_27
		Bands FDD_C	RSRP_27
		Bands FDD_D	RSRP_28
		Bands FDD_E, FDD_F	RSRP_28
		Bands FDD_G	RSRP_29
		Bands FDD_H	RSRP_30
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands FDD_A	RSRP_10
		Bands FDD_B	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	RSRP_74	Bands FDD_A	RSRP_31
		Bands FDD_B	RSRP_31
		Bands FDD_C	RSRP_32
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_33
		Bands FDD_G	RSRP_34
		Bands FDD_H	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP

9.1.3.2.1 Test purpose

To verify that the FDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.3.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.3.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.3.2.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.3.

9.1.3.2.4 Test description

9.1.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.3.2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.3.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.3.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.3.2.5-2 as appropriate.

9.1.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.2.4.3-1: Common Exception messages for RSRP FDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.2.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.2.5 Test requirement

Table 9.1.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.3.2.5-3.

Table 9.1.3.2.5-1: Void

Table 9.1.3.2.5-2: RSRP FDD - FDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note1						
OCNG_RB Note1						
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands FDD_B					-116.5
	Bands FDD_C					-116
	Bands FDD_D					-115.5
	Bands FDD_E, FDD_F Note 5					-115
	Bands FDD_G					-114
	Bands FDD_H					-113.5
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands FDD_B					-119.70
	Bands FDD_C					-119.20
	Bands FDD_D					-118.70
	Bands FDD_E, FDD_F Note 5					-118.20
	Bands FDD_G					-117.20
	Bands FDD_H					-116.70
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands FDD_B					-87.02
	Bands FDD_C					-86.52
	Bands FDD_D					-86.02
	Bands FDD_E, FDD_F Note 5					-85.52
	Bands FDD_G					-84.52
	Bands FDD_H					-84.02
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of						

	appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.2.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.2_1 FDD - FDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)

9.1.3.2_1.1 Test purpose

Same test purpose as in clause 9.1.3.2.1.

9.1.3.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.3.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.3.2_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.3.2_1.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.3.

9.1.3.2_1.4 Test description

9.1.3.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.3.2.4.1 with the following exceptions:

- Instead of 9.1.3.2.4.3 → use 9.1.3.2_1.4.3

9.1.3.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.3.2.4.2 with the following exceptions:

- Instead of Table 9.1.3.2.5-2 → use Table 9.1.3.2_1.5-1.
- Instead of Table 9.1.3.2.5-3 → use Table 9.1.3.2_1.5-2.

9.1.3.2_1.4.3 Message contents

Same message contents as in clause 9.1.3.2.4.3.

9.1.3.2_1.5 Test requirement

Table 9.1.3.2_1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.3.2_1.5-3.

Table 9.1.3.2_1.5-1: RSRP FDD - FDD Inter frequency relative accuracy test parameters

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Test 1</th><th colspan="2">Test 2</th></tr>
<tr><th>Cell 1</th><th>Cell 2</th><th>Cell 1</th><th>Cell 2</th></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>2</td><td>1</td><td>2</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td>MHz</td><td>10</td><td>10</td><td>10</td><td>10</td></tr>
<tr><td colspan="2">Gap Pattern Id</td><td></td><td>0</td><td>-</td><td>0</td><td>-</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td colspan="2">22—27</td><td colspan="2">22—27</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.1</td><td></td><td>R.0 FDD</td><td>-</td><td>R.0 FDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13—36</td><td>-</td><td>13—36</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1</td><td></td><td colspan="2">R.6 FDD</td><td colspan="2">R.6 FDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)</td><td></td><td>OP.1 FDD</td><td>OP.2 FDD</td><td>OP.1 FDD</td><td>OP.2 FDD</td></tr>
<tr><td colspan="2">PBCH_RA</td><td rowspan="13">dB</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td colspan="2">PBCH_RB</td></tr>
<tr><td colspan="2">PSS_RA</td></tr>
<tr><td colspan="2">SSS_RA</td></tr>
<tr><td colspan="2">PCFICH_RB</td></tr>
<tr><td colspan="2">PHICH_RA</td></tr>
<tr><td colspan="2">PHICH_RB</td></tr>
<tr><td colspan="2">PDCCH_RA</td></tr>
<tr><td colspan="2">PDCCH_RB</td></tr>
<tr><td colspan="2">PDSCH_RA</td></tr>
<tr><td colspan="2">PDSCH_RB</td></tr>
<tr><td colspan="2">OCNG_RA Note1</td></tr>
<tr><td colspan="2">OCNG_RB Note1</td></tr>
<tr><td rowspan="7">N_{oc} Note2</td><td>Bands FDD_A</td><td rowspan="7">dBm/15 kHz</td><td rowspan="7">-89.25</td><td rowspan="7">-89.25</td><td rowspan="7">(N_{oc} for Channel 2 +7dB)</td><td>-117</td></tr>
<tr><td>Bands FDD_B</td><td>-116.6</td></tr>
<tr><td>Bands FDD_C</td><td>-116</td></tr>
<tr><td>Bands FDD_D</td><td>-115.5</td></tr>
<tr><td>Bands FDD_E, FDD_F Note 5</td><td>-115</td></tr>
<tr><td>Bands FDD_G</td><td>-114</td></tr>
<tr><td>Bands FDD_H</td><td>-113.5</td></tr>
<tr><td colspan="2">$\hat{E}_s/I_{ot}$</td><td>dB</td><td>10.00</td><td>10.00</td><td>13.00</td><td>-3.20</td></tr>
<tr><td rowspan="7">RSRP Note3</td><td>Bands FDD_A</td><td rowspan="7">dBm/15 kHz</td><td rowspan="7">-79.25</td><td rowspan="7">-79.25</td><td rowspan="7">(RSRP for Cell 2 +23.2dB)</td><td>-120.20</td></tr>
<tr><td>Bands FDD_B</td><td>-119.70</td></tr>
<tr><td>Bands FDD_C</td><td>-119.20</td></tr>
<tr><td>Bands FDD_D</td><td>-118.70</td></tr>
<tr><td>Bands FDD_E, FDD_F Note 5</td><td>-118.20</td></tr>
<tr><td>Bands FDD_G</td><td>-117.20</td></tr>
<tr><td>Bands FDD_H</td><td>-116.70</td></tr>
<tr><td rowspan="7">Io Note3</td><td>Bands FDD_A</td><td rowspan="7">dBm/9 MHz</td><td rowspan="7">-51.05</td><td rowspan="7">-51.05</td><td rowspan="7">(Io for Channel 2 +18.51dB)</td><td>-87.52</td></tr>
<tr><td>Bands FDD_B</td><td>-87.02</td></tr>
<tr><td>Bands FDD_C</td><td>-86.52</td></tr>
<tr><td>Bands FDD_D</td><td>-86.02</td></tr>
<tr><td>Bands FDD_E, FDD_F Note 5</td><td>-85.52</td></tr>
<tr><td>Bands FDD_G</td><td>-84.52</td></tr>
<tr><td>Bands FDD_H</td><td>-84.02</td></tr>
<tr><td colspan="2">$\hat{E}_s/N_{oc}$</td><td>dB</td><td>10</td><td>10</td><td>13</td><td>-3.2</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td colspan="2">AWGN</td><td colspan="2">AWGN</td></tr>
<tr><td colspan="7">Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.</td></tr>
</table>

Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.3.2_1.5-2: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1 All bands	**Test 2 All bands**
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 7)	RSRP_(x - 30)
Highest reported value (Cell 2)	RSRP_(x + 7)	RSRP_(x - 17)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4 TDD Inter frequency RSRP Accuracy

9.1.4.1 TDD - TDD Inter Frequency Absolute RSRP Accuracy

9.1.4.1.1 Test purpose

To verify that the TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.4.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.4.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.1.4.1.3-1: RSRP TDD-TDD Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1 , clause 9.1.4 and A.9.1.4.

9.1.4.1.4 Test description

9.1.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.4.1.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.4.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3 SS shall check the reported RSRP value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.4.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.4.1.5-2 as appropriate.

9.1.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.1.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.1.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.1.5 Test requirement

Table 9.1.4.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.4.1.5-3.

Table 9.1.4.1.5-1: Void

Table 9.1.4.1.5-2: RSRP TDD-TDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration Note1			6		6	
Uplink-downlink configuration Note1			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io Note4	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.1.5-3: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Bands TDD_A	RSRP_13
		Bands TDD_C	RSRP_14
		Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_71	Bands TDD_A	RSRP_28
		Bands TDD_C	RSRP_29
		Bands TDD_E	RSRP_30
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands TDD_A	RSRP_10
		Bands TDD_C	RSRP_11
		Bands TDD_E	RSRP_12
Highest reported value (Cell 2)	RSRP_74	Bands TDD_A	RSRP_31
		Bands TDD_C	RSRP_32
		Bands TDD_E	RSRP_33

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.1_1 TDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)

9.1.4.1_1.1 Test purpose

Same test purpose as in clause 9.1.4.1.1

9.1.4.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.4.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.4.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.1.4.1_1.3-1: RSRP TDD-TDD Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1 , clause 9.1.4 and A.9.1.4.

9.1.4.1_1.4 Test description

9.1.4.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.4.1.4.1 with the following exceptions:

- Instead of 9.1.4.1.4.3 → use 9.1.4.1_1.4.3.

9.1.4.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.4.1.4.2 with the following exceptions:

- Instead of Table 9.1.4.1.5-2 → use Table 9.1.4.1_1.5-1.
- Instead of Table 9.1.4.1.5-3 → use Table 9.1.4.1_1.5-2.

9.1.4.1_1.4.3 Message contents

Same message contents as in clause 9.1.4.1.4.3

9.1.4.1_1.5 Test requirement

Table 9.1.4.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.4.1_1.5-2.

Table 9.1.4.1_1.5-1: RSRP TDD-TDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA [Note2]						
OCNG_RB [Note2]						
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +8dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +24.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io[Note4]	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +19.51 dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.1_1.5-2: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_52	Bands TDD_A	RSRP_14
		Bands TDD_C	RSRP_15
		Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_71	Bands TDD_A	RSRP_26
		Bands TDD_C	RSRP_27
		Bands TDD_E	RSRP_28
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_49	Bands TDD_A	RSRP_10
		Bands TDD_C	RSRP_11
		Bands TDD_E	RSRP_12
Highest reported value (Cell 2)	RSRP_74	Bands TDD_A	RSRP_31
		Bands TDD_C	RSRP_32
		Bands TDD_E	RSRP_33

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRP

9.1.4.2.1 Test purpose

To verify that the TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE from release 8 to release 11. Applicability requires support for FGI bits 16 and 25.

9.1.4.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.4.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.4.2.3-1: RSRP TDD-TDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	**Extreme condition**	**Ês/Iot Note 2**	**Io Note 1 range**		
			E-UTRA operating band groups Note 4	**Minimum Io**	**Maximum Io**
dB	**dB**	**dB**		**dBm/15kHz Note 3**	**dBm/BW$_{Channel}$**
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.4.

9.1.4.2.4 Test description

9.1.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.4.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.4.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each

MeasurementReport message according to Table 9.1.4.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.4.2.5-2 as appropriate.

9.1.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.2.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.2.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.2.5 Test requirement

Table 9.1.4.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.4.2.5-3. The mapping of measured quantity is defined in Table 9.1.4.2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4.2.5-1: Void

Table 9.1.4.2.5-2: RSRP TDD-TDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA [Note2] OCNG_RB [Note2]		dB	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io[Note4]	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.2.5-3: RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
	All bands	All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.2_1 TDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)

9.1.4.2_1.1 Test purpose

Same test purpose as in clause 9.1.4.2.1.

9.1.4.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bits 16 and 25.

9.1.4.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.4.2_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.4.2_1.3-1: RSRP TDD-TDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.4.

9.1.4.2_1.4 Test description

9.1.4.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.4.2.4.1 with the following exceptions:

- Instead of 9.1.4.2.4.3 → use 9.1.4.2_1.4.3.

9.1.4.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.4.2.4.2 with the following exceptions:

- Instead of Table 9.1.4.2.5-2 → use Table 9.1.4.2_1.5-1.
- Instead of Table 9.1.4.2.5-3 → use Table 9.1.4.2_1.5-2.

9.1.4.2_1.4.3 Message contents

Same message contents as in clause 9.1.4.2.4.3.

9.1.4.2_1.5 Test requirement

Table 9.1.4.2_1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.4.2_1.5-3. The mapping of measured quantity is defined in Table 9.1.4.2_1.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4.2_1.5-1: RSRP TDD-TDD Inter frequency relative accuracy test parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA [Note2]						
OCNG_RB [Note2]						
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-89.25	-89.25	(N_{oc} for Channel 2 +7dB)	-117
	Bands TDD_C					-116
	Bands TDD_E					-115
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	13.00	-3.20
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-79.25	-79.25	(RSRP for Cell 2 +23.2dB)	-120.20
	Bands TDD_C					-119.20
	Bands TDD_E					-118.20
Io[Note4]	Bands TDD_A	dBm/9 MHz	-51.05	-51.05	(Io for Channel 2 +18.51dB)	-87.52
	Bands TDD_C					-86.52
	Bands TDD_E					-85.52
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.4.2_1.5-2: RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
	All bands	**All bands**
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 7)	RSRP_(x - 30)
Highest reported value (Cell 2)	RSRP_(x + 7)	RSRP_(x - 17)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5 FDD - TDD Inter frequency RSRP Accuracy

9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy

9.1.5.1.1 Test purpose

To verify that the FDD - TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.5.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD from release 9 to release 11. Applicability requires support for FGI bit 25.

9.1.5.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.5.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.5.1.3-1: RSRP FDD - TDD Inter frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.5.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.5.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.5.

9.1.5.1.4 Test description

9.1.5.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.5.1.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.5.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.5.1.5-1 and Table 9.1.5.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.5.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.5.1.5-1 and Table 9.1.5.1.5-2 as appropriate.

9.1.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.5.1.4.3-1: Common Exception messages for RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.5.1.4.3-2: *MeasResults*: Additional RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.5.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD-TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.5.1.5 Test requirement

Table 9.1.5.1.5-1 and Table 9.1.5.1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.5.1.5-3.

Table 9.1.5.1.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Test 1</th><th colspan="2">Test 2</th></tr>
<tr><th colspan="2">Cell 1</th><th colspan="2">Cell 1</th></tr>
<tr><td>E-UTRA RF Channel Number</td><td></td><td colspan="2">1</td><td colspan="2">1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="2">10</td><td colspan="2">10</td></tr>
<tr><td>Gap Pattern Id</td><td></td><td colspan="2">0</td><td colspan="2">0</td></tr>
<tr><td>Measurement bandwidth</td><td>n_{PRB}</td><td colspan="2">22—27</td><td colspan="2">22—27</td></tr>
<tr><td>PDSCH Reference measurement channel defined in A.3.1.1.1</td><td></td><td colspan="2">R.0 FDD</td><td colspan="2">R.0 FDD</td></tr>
<tr><td>PDSCH allocation</td><td>n_{PRB}</td><td colspan="2">13—36</td><td colspan="2">13—36</td></tr>
<tr><td>PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1</td><td></td><td colspan="2">R.6 FDD</td><td colspan="2">R.6 FDD</td></tr>
<tr><td>OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)</td><td></td><td colspan="2">OP.1 FDD</td><td colspan="2">OP.1 FDD</td></tr>
<tr><td>PBCH_RA</td><td rowspan="13">dB</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td>PBCH_RB</td></tr>
<tr><td>PSS_RA</td></tr>
<tr><td>SSS_RA</td></tr>
<tr><td>PCFICH_RB</td></tr>
<tr><td>PHICH_RA</td></tr>
<tr><td>PHICH_RB</td></tr>
<tr><td>PDCCH_RA</td></tr>
<tr><td>PDCCH_RB</td></tr>
<tr><td>PDSCH_RA</td></tr>
<tr><td>PDSCH_RB</td></tr>
<tr><td>OCNG_RANote1</td></tr>
<tr><td>OCNG_RBNote</td></tr>
<tr><td>N_{oc} Note2</td><td>dBm/15 kHz</td><td colspan="2">-89.25</td><td colspan="2">-104</td></tr>
<tr><td>$\hat{E}_s/I_{ot}$</td><td>dB</td><td colspan="2">10</td><td colspan="2">13</td></tr>
<tr><td>RSRP Note3</td><td>dBm/15 kHz</td><td colspan="2">-79.25</td><td colspan="2">-91</td></tr>
<tr><td>Io Note3</td><td>dBm/9 MHz</td><td colspan="2">-51.05</td><td colspan="2">-63.01</td></tr>
<tr><td>$\hat{E}_s/N_{oc}$</td><td>dB</td><td colspan="2">10</td><td colspan="2">13</td></tr>
<tr><td>Propagation condition</td><td>-</td><td colspan="2">AWGN</td><td colspan="2">AWGN</td></tr>
<tr><td colspan="6">Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.</td></tr>
</table>

Table 9.1.5.1.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112
$\hat{E}_s/I_{ot}$	dB	10	-3.2
RSRP[Note4]	dBm/15 kHz	-79.25	-115.2
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s/N_{oc}$	dB	10	-3.2
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1.5-3: RSRP FDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_52	RSRP_18
Highest reported value (Cell 2)	RSRP_71	RSRP_33
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_49	RSRP_15
Highest reported value (Cell 2)	RSRP_74	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.1_1 FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)

Editor's note: This Test case is incomplete for frequencies above 3GHz

- The Test system uncertainties applicable above 3GHz are undefined
- The Test Tolerances and Test Requirements applicable above 3GHz are undefined
- Test requirements for Test2 in normal conditions are TBD

9.1.5.1_1.1 Test purpose

Same test purpose as in clause 9.1.5.1.1.

9.1.5.1_1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 12 and forward. Applicability requires support for FGI bit 25.

9.1.5.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.5.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP$|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.5.1_1.3-1: RSRP FDD - TDD Inter frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70

±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.5.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.5.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.5.

9.1.5.1_1.4 Test description

9.1.5.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.5.1.4.1 with the following exceptions:

- Instead of 9.1.5.1.4.3 → use 9.1.5.1_1.4.3.

9.1.5.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.5.1.4.2 with the following exceptions:

- Instead of Table 9.1.5.1.5-1 → use Table 9.1.5.1_1.5-1.
- Instead of Table 9.1.5.1.5-2 → use Table 9.1.5.1_1.5-2.
- Instead of Table 9.1.5.1.5-3 → use Table 9.1.5.1_1.5-3.

9.1.5.1_1.4.3 Message contents

Same message contents as in clause 9.1.5.1.4.3

9.1.5.1_1.5 Test requirement

Table 9.1.5.1_1.5-1 and Table 9.1.5.1_1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.5.1_1.5-3.

Table 9.1.5.1_1.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1	Test 2
		Cell 1	Cell 1

E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote	dB	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-88.95		-104	
$\hat{E}_s/I_{ot}$	dB	10		13	
RSRP Note3	dBm/15 kHz	-78.95		-91	
Io Note3	dBm/9 MHz	-50.75		-63.01	
$\hat{E}_s/N_{oc}$	dB	10		13	
Propagation condition	-	AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1_1.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2

E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]	dB	0	0
N_{oc} [Note3]	dBm/15 kHz	-88.95	-112
$\hat{E}_s/I_{ot}$	dB	10	-3.2
RSRP[Note4]	dBm/15 kHz	-78.95	-115.2
Io[Note4]	dBm/9 MHz	-50.75	-82.52
$\hat{E}_s/N_{oc}$	dB	10	-3.2
Propagation condition	-	AWGN	AWGN

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.1_1.5-3: RSRP FDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_52	TBD
Highest reported value (Cell 2)	RSRP_71	TBD
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_49	RSRP_15
Highest reported value (Cell 2)	RSRP_74	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP

9.1.5.2.1 Test purpose

To verify that the FDD-TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.5.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD from release 9 to release 11. Applicability requires support for FGI bit 25.

9.1.5.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.5.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.5.2.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.5.

9.1.5.2.4 Test description

9.1.5.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.5.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.5.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.5.2.5-1 and Table 9.1.5.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.5.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.5.2.5-1 and Table 9.1.5.2.5-2 as appropriate.

9.1.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.5.2.4.3-1: Common Exception messages for RSRP FDD-TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.5.2.4.3-2: *MeasResults*: Additional RSRP FDD-TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.5.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD-TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity	Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.5.2.5 Test requirement

Table 9.1.5.2.5-1 and Table 9.1.5.2.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.5.2.5-3.

Table 9.1.5.2.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote	dB	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-89.25		-105.0	
$\hat{E}_s/I_{ot}$	dB	10.00		13.00	
RSRP Note3	dBm/15 kHz	-79.25		-92.00	
Io Note3	dBm/9 MHz	-51.05		-64.01	
$\hat{E}_s/N_{oc}$	dB	10.00		13.00	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-89.25	-112.00
$\hat{E}_s/I_{ot}$	dB	10.00	-3.20
RSRP[Note4]	dBm/15 kHz	-79.25	-115.20
Io[Note4]	dBm/9 MHz	-51.05	-82.52
$\hat{E}_s/N_{oc}$	dB	10.00	-3.20
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2.5-3: RSRP FDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x -9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.5.2_1 FDD - TDD Inter Frequency Relative Accuracy of RSRP (Rel-12 and forward)

Editor's note: This test case is incomplete for frequencies above 3GHz

- The test system uncertainties applicable above 3GHz are undefined

- The test tolerances and test requirements applicable above 3GHz are undefined

- Test requirements for Test 1 and 2 in normal conditions are TBD

9.1.5.2_1.1 Test purpose

Same test purpose as in clause 9.1.5.2.1.

9.1.5.2_1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 12 and forward. Applicability requires support for FGI bit 25.

9.1.5.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.5.2_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{\text{dBm}}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.5.2_1.3-1: RSRP FDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.5.

9.1.5.2_1.4 Test description

9.1.5.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.5.2.4.1 with the following exceptions:

- Instead of 9.1.5.2.4.3 → use 9.1.5.2_1.4.3.

9.1.5.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.5.2.4.2 with the following exceptions:

- Instead of Table 9.1.5.2.5-1→ use Table 9.1.5.2_1.5-1.
- Instead of Table 9.1.5.2.5-2 → use Table 9.1.5.2_1.5-2.
- Instead of Table 9.1.5.2.5-3 → use Table 9.1.5.2_1.5-3.

9.1.5.2_1.4.3 Message contents

Same message contents as in clause 9.1.5.2.4.3.

9.1.5.2_1.5 Test requirement

Table 9.1.5.2_1.5-1 and Table 9.1.5.2_1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRP FDD-TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.5.2_1.5-3.

Table 9.1.5.2_1.5-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

Parameter	Unit	Test 1		Test 2	
		Cell 1		Cell 1	
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
Gap Pattern Id		0		0	
Measurement bandwidth	n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.0 FDD		R.0 FDD	
PDSCH allocation	n_{PRB}	13—36		13—36	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.1 FDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote	dB	0	0	0	0
N_{oc} Note2	dBm/15 kHz	-88.95		-104.60	
$\hat{E}_s/I_{ot}$	dB	10.00		13.00	
RSRP Note3	dBm/15 kHz	-78.95		-91.60	
Io Note3	dBm/9 MHz	-50.75		-63.61	
$\hat{E}_s/N_{oc}$	dB	10.00		13.00	
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2_1.5-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

Parameter	Unit	Test 1	Test 2
		Cell 2	Cell 2
E-UTRA RF Channel Number		2	2
$BW_{channel}$	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note1]		1	1
Gap Pattern Id		-	-
Measurement bandwidth	n_{PRB}	22—27	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2		-	-
PDSCH allocation	n_{PRB}	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2		R.6 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	dBm/15 kHz	-88.95	-112.00
$\hat{E}_s/I_{ot}$	dB	10.00	-3.20
RSRP[Note4]	dBm/15 kHz	-78.95	-115.20
Io[Note4]	dBm/9 MHz	-50.75	-82.52
$\hat{E}_s/N_{oc}$	dB	10.00	-3.20
Propagation condition	-	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.5.2_1.5-3: RSRP FDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x -8)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6 FDD RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.6.1 FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.6.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier.

9.1.6.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.6.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.6.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.6.1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.6.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.6.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.6

9.1.6.1.4 Test description

9.1.6.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.6.1.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.6.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.6.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.6.1.5-3. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1” and “Cell 2”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.6.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.6.1.5 Test requirement

Table 9.1.6.1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.6.1.5-3.

Table 9.1.6.1.5-1: Void

Table 9.1.6.1.5-2: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	**Cell 2**	**Cell3**
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.46	-5.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		

Io[Note3]	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_B		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F [Note 6]		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
$\hat{E}_s/N_{oc}$		dB	-4	3	-1
Propagation condition		-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands. Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands. Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 10: E-UTRA operating band groups are as defined in Section 3.5.					

Table 9.1.6.1.5-3: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_12	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6.1_1 FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

9.1.6.1_1.1 Test purpose

Same test purpose as in clause 9.1.6.1.1.

9.1.6.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.6.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.6.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.6.1_1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.6.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.6.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.6.

9.1.6.1_1.4 Test description

9.1.6.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.6.1.4.1 with the following exceptions:

- Instead of 9.1.6.1.4.3 → use 9.1.6.1_1.4.3.

9.1.6.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.6.1.4.2 with the following exceptions:

- Instead of Table 9.1.6.1.5-2 → use Table 9.1.6.1_1.5-1.
- Instead of Table 9.1.6.1.5-3 → use Table 9.1.6.1_1.5-2.

9.1.6.1_1.4.3 Message contents

Same message contents as in clause 9.1.6.1.4.3.

9.1.6.1_1.5 Test requirement

Table 9.1.6.1_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.6.1_1.5-2.

Table 9.1.6.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3

E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.46	-5.76
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
IoNote3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_B		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		

$\hat{E}_s/N_{oc}$	dB	-4	3	-1
Propagation condition	-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands. Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands. Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 10: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.6.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.6.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and FDD relative RSRP accuracy between the secondary component carriers.

9.1.6.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.6.2.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.6.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.6.2.3-1: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.6.2.3-2 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.6.2.3-2: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 6	dBm/BW_{Channel}
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
±3	±3	≥-6 dB	Note 4	Note 4	Note 4

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 6: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.6.

9.1.6.2.4 Test description

9.1.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.6.2.4.3.

4. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.6.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.6.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.6.2.5-3. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.6.2.5-3. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1-2” and “Cell 2-3”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.6.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.6.2.5 Test requirement

Table 9.1.6.2.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.6.2.5-3.

Table 9.1.6.2.5-1: Void

Table 9.1.6.2.5-2: RSRP FDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.09	-4.96
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
IoNote3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_B		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2

Propagation condition	-	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz Note 7: This band is used only for E-UTRA carrier aggregation with other E-UTRA bands. Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands. Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 10: E-UTRA operating band groups are as defined in Section 3.5.		

Table 9.1.6.2.5-3: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

9.1.6.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.6.2.1.

9.1.6.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.6.2_1.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.6.2_1.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
    - | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.6.2_1.3-1: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.6.2_1.3-2 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.6.2_1.3-2: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.6.

9.1.6.2_1.4 Test description

9.1.6.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.6.2.4.1.

9.1.6.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.6.2.4.2 with the following exceptions:

- Instead of Table 9.1.6.2.5-2 → use Table 9.1.6.2_1.5-1.
- Instead of Table 9.1.6.2.5-3 → use Table 9.1.6.2_1.5-2.

9.1.6.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.6.2.4.3.

9.1.6.2_1.5 Test requirement

Table 9.1.6.2_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.6.2_1.5-2.

Table 9.1.6.2_1.5-1: RSRP FDD relative accuracy carrier aggregation test parameters

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3

E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.09	-4.96
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
IoNote3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_B		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		

$\hat{E}_s/N_{oc}$	dB	-4	3	-0.2
Propagation condition	-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz Note 7: This band is used only for E-UTRA carrier aggregation with other E-UTRA bands. Note 8: If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands. Note 9: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 10: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.6.2_1.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7 TDD RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.7.1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.7.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier.

9.1.7.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.7.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.7.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.7.1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.7.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.7.

9.1.7.1.4 Test description

9.1.7.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.7.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.7.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCC is configured and activated. The absolute accuracy of RSRP is defined as the RSRP measured from the primary component carrier (Cell 1) and the RSRP measured from the secondary component carrier (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.7.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.7.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1” and “Cell 2”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.7.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.7.1.5 Test requirement

Table 9.1.7.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.7.1.5-2.

Table 9.1.7.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.46	-5.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s/N_{oc}$		dB	-4	3	-1
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise

	at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7.1_1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The Test tolerances applicable to this test are undefined

9.1.7.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.7.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.7.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.7.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.7.1_1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.7.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.7.

9.1.7.1_1.4 Test description

9.1.7.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.7.1.4.1 with the following exceptions:

- Instead of 9.1.7.1.4.3 → use 9.1.7.1_1.4.3.

9.1.7.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.7.1_1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.7.1_1.5-2.

9.1.7.1_1.4.3 Message contents

Same message contents as in clause 9.1.7.1.4.3

9.1.7.1_1.5 Test requirement

Table 9.1.7.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.7.1_1.5-2.

Table 9.1.7.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1 Cell 1	Test 1 Cell 2	Test 1 Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.46	-5.76
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s/N_{oc}$		dB	-4	3	-1
Propagation condition		-	AWGN		

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

NOTE 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 5: RSRP minimum requirements are specified assuming independent interference and noise

	at each receiver antenna port.
NOTE 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
NOTE 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
NOTE 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	TBD	TBD	TBD
Highest reported value (Cell 1)	TBD	TBD	TBD
Lowest reported value (Cell 2)	TBD	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD	TBD
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation

9.1.7.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and TDD relative RSRP accuracy of cells on the secondary component carriers.

9.1.7.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.7.2.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.7.2.3-1: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.7.2.3-2: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

9.1.7.2.4 Test description

9.1.7.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.7.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.7.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.7.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.7.2.5-2. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.7.2.5-2. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events (“Cell 1-2” and “Cell 2-3”) pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.7.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.7.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.7.2.5 Test requirement

Table 9.1.7.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.7.2.5-2.

Table 9.1.7.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s/I_{ot}$		dB	-4.00	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: RSRP minimum requirements are specified assuming independent interference and noise					

	at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.7.2_1 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)

Editor's note: This Test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Test requirements in normal conditions need to be defined*

9.1.7.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.7.2.1.

9.1.7.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.7.2_1.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2_1.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band

- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$

- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.7.2_1.3-1: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW Channel
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.7.2_1.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.7.2_1.3-2: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW Channel
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.7.

9.1.7.2_1.4 Test description

9.1.7.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.7.2.4.1.

9.1.7.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.4.2-1 → use Table 9.1.7.2_1.5-1.
- Instead of Table 9.1.7.2.4.2-2 → use Table 9.1.7.2_1.5-2.

9.1.7.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.7.2.4.2.

9.1.7.2_1.5 Test requirement

Table 9.1.7.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.7.2_1.5-2.

Table 9.1.7.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Timing offset to Cell 1		µs	-	0	3µs or 92*Ts
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117+TT	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116+TT		
	Bands TDD_E		-115+TT		
$\hat{E}_s/I_{ot}$		dB	-4.00+TT	0.09+TT	-4.96+TT
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121+TT	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120+TT		
	Bands TDD_E		-119+TT		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76+TT	(Io for Channel 1 +5.51dB)	
	Bands TDD_C		-86.76+TT		
	Bands TDD_E		-85.76+TT		
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-0.2+TT
Propagation condition		-	AWGN		
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211[9]. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: RSRP minimum requirements are specified assuming independent interference and noise					

	at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
Note 7:	If test configuration is Inter-band carrier aggregation, the frequencies of PCell and SCell shall be switched and tested for each configuration according to the UE declared capability for UL support (within CA operation) in the individual bands.
Note 8:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.7.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	TBD
Highest reported value (Cell 2)	TBD
Lowest reported value (Cell 3)	TBD
Highest reported value (Cell 3)	TBD
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.8 FDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.8.1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.8.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions.

9.1.8.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11. Applicability requires support for FGI bit 115.

9.1.8.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.8.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.8.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol. NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.8.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.8.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.8

9.1.8.1.4 Test description

9.1.8.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.8.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.8.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.8.1.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 !=0	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'1000000010000000100000001000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'1000000010000000100000001000000010000000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'0100000001000000010000000100000001000000'	Configured for measurements on Cell 1.

9.1.8.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.8.1.4.1-1 and Table 9.1.8.1.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRP.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.8.1.4.1-1 and Table 9.1.8.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 2 are compared to the actual RSRP values according to Table 9.1.8.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.8.1.5-1 as appropriate.

9.1.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.8.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.8.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.8.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.8.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000001000000010000000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.8.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.8.1.5 Test requirement

Table 9.1.8.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.8.1.5-2.

Table 9.1.8.1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88	-2.00	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands FDD_B						-110.5	-118.55
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 7						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-71.41	-74.88	-53.54	-57.16	-81.54	-85.16
	Bands FDD_B						-81.04	-84.66
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.8.1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands FDD_A	RSRP_14
			Bands FDD_B	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_B	RSRP_29
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_30
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_B	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.8.1_1 FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)

Editor's note: This test case is incomplete. The following item is missing or incomplete:

The test tolerances and test requirements for test 1, 2 and 3 in normal conditions are TBD

9.1.8.1_1.1 Test purpose

Same test purpose as in clause 9.1.8.1.1.

9.1.8.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bit 115.

9.1.8.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.8.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.8.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
			Io Note 2 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.8.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.8.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.8

9.1.8.1_1.4 Test description

9.1.8.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.8.1.4.1.

9.1.8.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.8.1.4.2 with the following exceptions:

- Instead of Table 9.1.8.1.5-1→ use Table 9.1.8.1_1.5-1.
- Instead of Table 9.1.8.1.5-2→ use Table 9.1.8.1_1.5-2.

9.1.8.1_1.4.3 Message contents

Same message contents as in clause 9.1.8.1.4.3.

9.1.8.1_1.5 Test requirement

Table 9.1.8.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.8.1_1.5-2.

Table 9.1.8.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.5 (OP.5 FDD) and A.3.2.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G Note 9						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5+TT	-2+TT	5+TT	-4+TT	5+TT	-4+TT
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88+TT	-2+TT	3.54+TT	-4+TT	3.54+TT	-4+TT
SCH $\hat{E}_s / I_{ot}$		dB	-1.12+TT	-5.54+TT	-0.46+TT	-7.54+TT	-0.46+TT	-7.54+TT
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-101+TT	-108+TT	-83+TT	-92+TT	-111+TT	-120+TT
	Bands FDD_C						-110+TT	-119+TT
	Bands FDD_D						-109.5+TT	-118.5+TT
	Bands FDD_E, FDD_F Note 7						-109+TT	-118+TT
	Bands FDD_G Note 9						-108+TT	-117+TT
	Bands FDD_H						-107.5+TT	-116.5+TT
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-71.41+TT	-74.88+TT	-53.63+TT	-57.37+TT	-81.63+TT	-85.37+TT

	Bands FDD_C						-80.63+TT	-84.37+TT
	Bands FDD_D						-80.13+TT	-83.87+TT
	Bands FDD_E, FDD_F Note 7						-79.63+TT	-83.37+TT
	Bands FDD_G Note 9						-78.63+TT	-82.37+TT
	Bands FDD_H						-78.13+TT	-81.87+TT
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: Except Band 29 and Band 32.

Table 9.1.8.1_1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	TBD	TBD	Bands FDD_A	TBD
			Bands FDD_C	TBD
			Bands FDD_D	TBD
			Bands FDD_E, FDD_F	TBD
			Bands FDD_G	TBD
			Bands FDD_H	TBD
Highest reported value (Cell 2)	TBD	TBD	Bands FDD_A	TBD
			Bands FDD_C	TBD
			Bands FDD_D	TBD
			Bands FDD_E, FDD_F	TBD
			Bands FDD_G	TBD
			Bands FDD_H	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.8.2 FDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.8.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation condition.

9.1.8.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.1.8.2.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.8.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.10 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.8.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 5	dBm/BW Channel
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.8.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.8.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4 , clause 9.1.4 and A.9.1.8

9.1.8.2.4 Test description

9.1.8.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.8.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.8.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.8.2.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6$!=0	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'1000000010000000100000001000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'1000000010000000100000001000000010000000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'0100000001000000010000000100000001000000'	Configured for measurements on Cell 1.

9.1.8.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.8.2.4.1-1 and Table 9.1.8.2.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 1 and Cell 2 are both measured.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.8.2.4.1-1 and Table 9.1.8.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.8.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.8.2.5-1 as appropriate.

9.1.8.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.8.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.8.2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.8.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.8.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000001000000010000000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.8.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.8.2.5 Test requirement

Table 9.1.8.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.8.2.5-2.

Table 9.1.8.2.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.55	-1.20	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 7						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-71.30	-74.63	-53.54	-57.16	-81.54	-85.16
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.8.2.5-2: E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.9 TDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.9.1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.9.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions.

9.1.9.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11. Applicability requires support for FGI bit 115.

9.1.9.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.9.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.9.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.9.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3 , clause 9.1.4 and A.9.1.9

9.1.9.1.4 Test description

9.1.9.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.9.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.9.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.9.1.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})$mod6 !=0	Cell PCIs for Cell 1 and Cell 2 are randomly selected so that the condition is met
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

9.1.9.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.9.1.4.1-1 and Table 9.1.9.1.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRP.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.9.1.4.1-1 and Table 9.1.9.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 2 are compared to the actual RSRP values according to Table 9.1.9.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.9.1.5-1 as appropriate.

9.1.9.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.9.1.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.9.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.9.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.9.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	‘10000000001000000000’	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.9.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	‘00000000010000000001’	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.9.1.5 Test requirement

Table 9.1.9.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.9.1.5-2.

Table 9.1.9.1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88	-2.00	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.9.1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands TDD_A	RSRP_29
			Bands TDD_C	RSRP_30
			Bands TDD_E	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.9.1_1 TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)

Editor's note: This test case is incomplete. The following item is missing or incomplete:

The test tolerances and test requirements for test 1, 2 and 3 in normal conditions are TBD

9.1.9.1_1.1 Test purpose

Same test purpose as in clause 9.1.9.1.1.

9.1.9.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 115.

9.1.9.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.9.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol. NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.9.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.9.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.9

9.1.9.1_1.4 Test description

9.1.9.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.9.1.4.1.

9.1.9.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.8.1.4.2 with the following exceptions:

- Instead of Table 9.1.8.1.5-1→ use Table 9.1.8.1_1.5-1.

- Instead of Table 9.1.8.1.5-2→ use Table 9.1.8.1_1.5-2.

9.1.9.1_1.4.3 Message contents

Same message contents as in clause 9.1.9.1.4.3.

9.1.9.1_1.5 Test requirement

Table 9.1.9.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.9.1_1.5-2.

Table 9.1.9.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5+TT	-2+TT	5+TT	-4+TT	5+TT	-4+TT
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.88+TT	-2+TT	3.54+TT	-4+TT	5+TT	-4+TT
SCH $\hat{E}_s / I_{ot}$		dB	-1.12+TT	-5.54+TT	-0.46+TT	-7.54+TT	-0.46+TT	-7.54+TT
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-101+TT	-108+TT	-83+TT	-92+TT	-111+TT	-120+TT
	Bands TDD_C						-110+TT	-119+TT
	Bands TDD_E						-109+TT	-118+TT
$(\mathrm{Io})_{meas}$ Note 3	Bands TDD_A	dBm/9 MHz	-71.41+TT	-74.88+TT	-53.63+TT	-57.37+TT	-81.6+TT	-85.4+TT
	Bands TDD_C						-80.6+TT	-84.4+TT
	Bands TDD_E						-79.6+TT	-83.4+TT
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.
Note 7:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.9.1_1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	TBD	TBD	Bands TDD_A	TBD
			Bands TDD_C	TBD
			Bands TDD_E	TBD
Highest reported value (Cell 2)	TBD	TBD	Bands TDD_A	TBD
			Bands TDD_C	TBD
			Bands TDD_E	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.9.2 TDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.1.9.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy measurements under time-domain measurement resource restriction with Non-MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation condition.

9.1.9.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.1.9.2.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.9.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.10 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.9.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 3 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 5	dBm/$BW_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.9.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.9.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4 , clause 9.1.4 and A.9.1.9

9.1.9.2.4 Test description

9.1.9.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.1.9.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.9.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.9.2.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6 != 0$	Cell PCIs for Cell 1 and Cell 2 are randomly selected so that the condition is met
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [2], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

9.1.9.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Tables 9.1.9.2.4.1-1 and Table 9.1.9.2.5-1 for non-MBSFN ABS with non-colliding CRS. Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 1 and Cell 2 are both measured.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.1.9.2.4.1-1 and Table 9.1.9.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.9.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.9.2.5-1 as appropriate.

9.1.9.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.9.2.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.9.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.9.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.9.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	‘10000000001000000000’	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.9.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	‘00000000010000000001’	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.1.9.2.5 Test requirement

Table 9.1.9.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the reported values test requirements in table 9.1.9.2.5-2.

Table 9.1.9.2.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s / N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	2.55	-1.2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s / I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3	Bands TDD_A	dBm/9 MHz	-71.30	-74.63	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.9.2.5-2: E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.10 FDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.10.1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.10.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRP accuracy.

9.1.10.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting eICIC. Applicability requires support for FGI bit 115.

9.1.10.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.10.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.10.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol. NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.10.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.10.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3 , clause 9.1.4 and A.9.1.10

9.1.10.1.4 Test description

9.1.10.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.10.1.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.10.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2.A.3.

2. Set the parameters according to Table 9.1.10.1.5-1 and 9.1.10.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.10.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.10.1.5-2 as appropriate.

9.1.10.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.10.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.10.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.10.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.10.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0001000000010000000100000001000000010000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.10.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'0100000001000000010000000010000001000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.10.1.4.3-6: *SystemInformationBlockType2*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 2
}			

Table 9.1.10.1.4.3-7: *SystemInformationBlockType3*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.10.1.5 Test requirement

Table 9.1.10.1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.10.1.5-3.

Table 9.1.10.1.5-1: General test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'01000000100000001000000000010000001000000'	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'01000000100000001000000000010000001000000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'000100000001000000010000000010000000010000'	Configured for measurements on Cell 1.

Table 9.1.10.1.5-2: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.8 (OP.8 FDD) and D.1.6 (OP.6 FDD) Note5			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s/N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $(\hat{E}_s/Iot)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $(\hat{E}_s/Iot)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands FDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 8						-109	-117.95
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands FDD_C						-80.63	-84.37
	Bands FDD_D						-80.13	-83.87
	Bands FDD_E, FDD_F Note 8						-79.63	-83.37
	Bands FDD_G						-78.63	-82.37
	Bands FDD_H						-78.13	-81.87
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other	Bands FDD_A	dBm/9 MHz	-71.41	-76.09	-53.54	-57.16	-81.54	-85.16
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E,						-79.54	-83.16

than the 1st one	FDD_F Note 8							
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS36.133 [4] clause 9.1.2.3 and 9.1.2.4.
Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.10.1.5-3: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands FDD_A	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_30
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_32
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.10.1_1 FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward)

Editor's note: This test case is incomplete. The following item is missing or incomplete:

The test tolerances and test requirements for test 1, 2 and 3 in normal conditions are TBD

9.1.10.1_1.1 Test purpose

Same test purpose as in clause 9.1.10.1.1.

9.1.10.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.10.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.10.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.10.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
			Io Note 2 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 3	dBm/BWChannel	dBm/BWChannel
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.10.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.10.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.10.

9.1.10.1_1.4 Test description

9.1.10.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.10.1.4.1.

9.1.10.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.10.1.4.2 with the following exceptions:

- Instead of Table 9.1.10.1.5-1→ use Table 9.1.10.1_1.5-1.
- Instead of Table 9.1.10.1.5-2→ use Table 9.1.10.1_1.5-2.
- Instead of Table 9.1.10.1.5-3→ use Table 9.1.10.1_1.5-3.

9.1.10.1_1.4.3 Message contents

Same message contents as in clause 9.1.10.1.4.3.

9.1.10.1_1.5 Test requirement

Table 9.1.10.1_1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.10.1_1.5-3.

Table 9.1.10.1_1.5-1: General test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		‘0100000010000000100000000010000001000000’	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		‘0100000010000000100000000010000001000000’	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		‘0001000000010000000100000001000000010000’	Configured for measurements on Cell 1.

Table 9.1.10.1_1.5-2: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.8 (OP.8 FDD) and A.3.2.1.6 (OP.6 FDD)			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G Note 10						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s/N_{oc}$		dB	5+TT	-2+TT	5+TT	-4+TT	5+TT	-4+TT
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ Note 5, 7 in the 1st OFDM symbol		dB	2.88+TT	-8.19+TT	3.54+TT	-10.19+TT	3.54+TT	-10.19+TT
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ Note 5 in OFDM symbols 4,7,11		dB	2.88+TT	-2+TT	3.54+TT	-4+TT	3.54+TT	-4+TT
SCH $\hat{E}_s/I_{ot}$		dB	-1.12+TT	-5.54+TT	-0.46+TT	-7.54+TT	-0.46+TT	-7.54+TT
RSRP Note 3,4	Bands FDD_A	dBm/15 kHz	-101+TT	-108+TT	-83+TT	-92+TT	-111+TT	-120+TT
	Bands FDD_C						-110+TT	-119+TT
	Bands FDD_D						-109.5+TT	-118.5+TT
	Bands FDD_E, FDD_F Note 8						-109+TT	-118+TT
	Bands FDD_G Note 10						-108+TT	-117+TT

	Bands FDD_H						-107.5+TT	-116.5+TT
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-71.41+TT	-74.88+TT	-53.63+TT	-57.37+TT	-81.63+TT	-85.37+TT
	Bands FDD_C						-80.63+TT	-84.37+TT
	Bands FDD_D						-80.13+TT	-83.87+TT
	Bands FDD_E, FDD_F Note 8						-79.63+TT	-83.37+TT
	Bands FDD_G Note 10						-78.63+TT	-82.37+TT
	Bands FDD_H						-78.13+TT	-81.87+TT
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands FDD_A	dBm/9 MHz	-71.41+TT	-76.09+TT	-53.63+TT	-58.76+TT	-81.63+TT	-86.76+TT
	Bands FDD_C						-80.63+TT	-85.76+TT
	Bands FDD_D						-80.13+TT	-85.26+TT
	Bands FDD_E, FDD_F Note 8						-79.63+TT	-84.76+TT
	Bands FDD_G Note 10						-78.63+TT	-83.76+TT
	Bands FDD_H						-78.13+TT	-83.26+TT
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes of the respective cell.

Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.2.1-1.

Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.

Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Note 10: Except Band 29 and Band 32.

Table 9.1.10.1_1.5-3: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	TBD	TBD	Bands FDD_A	TBD
			Bands FDD_C	TBD
			Bands FDD_D	TBD
			Bands FDD_E, FDD_F	TBD
			Bands FDD_G	TBD
			Bands FDD_H	TBD
Highest reported value (Cell 2)	TBD	TBD	Bands FDD_A	TBD
			Bands FDD_C	TBD
			Bands FDD_D	TBD
			Bands FDD_E, FDD_F	TBD
			Bands FDD_G	TBD
			Bands FDD_H	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_33
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.10.2 FDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.10.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRP accuracy requirements.

9.1.10.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.10.2.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.4.

The accuracy requirements in Table 9.1.10.2.3-1 for relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex I.3.1 for a corresponding Band

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.10.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 3 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 5	dBm/BW$_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.10.

9.1.10.2.4 Test description

9.1.10.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.10.2.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.10.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2.A.3.

2. Set the parameters according to Table 9.1.10.2.5-1 and 9.1.10.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.10.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.10.2.5-2 as appropriate.

9.1.10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.10.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3 Table H.3.5-5

Table 9.1.10.2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.10.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.10.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0001000000010000000100000001000000010000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.10.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'0100000001000000010000000010000001000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.10.2.4.3-6: *SystemInformationBlockType2*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 2
}			

Table 9.1.10.2.4.3-7: *SystemInformationBlockType3*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.10.2.5 Test requirement

Table 9.1.10.2.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.10.2.5-3.

Table 9.1.10.2.5-1: General test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'0100000010000000100000000001000000100000'	MBSFN ABS pattern. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0 , where x is the size of the bit string (40) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'0100000010000000100000000001000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'0001000000010000000100000000100000000010000'	Configured for measurements on Cell 1.

Table 9.1.10.2.5-2: Cell Specific test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.8 (OP.8 FDD) and D.1.6 (OP.6 FDD) Note5			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-106		-88		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 8						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s/N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.55	-1.2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands FDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 8						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-71.3	-74.63	-53.54	-57.16	-81.54	-85.16
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 8						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands FDD_A	dBm/9 MHz	-71.30	-75.77	-53.54	-58.47	-81.54	-86.47
	Bands FDD_C						-80.54	-85.47
	Bands FDD_D						-80.04	-84.97
	Bands FDD_E, FDD_F Note 8						-79.54	-84.47
	Bands FDD_G						-78.54	-83.47
	Bands FDD_H						-78.04	-82.97

Propagation condition		AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS36.133 [4] clause 9.1.2.3 and 9.1.2.4.
Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.10.2.5-3: E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.11 TDD RSRP Accuracy E-UTRA under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.11.1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.11.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy measurements under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRP accuracy.

9.1.11.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting eICIC. Applicability requires support for FGI bit 115.

9.1.11.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.11.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|$_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.11.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.11.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.11.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3 , clause 9.1.4 and A.9.1.11

9.1.11.1.4 Test description

9.1.11.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.11.1.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.11.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3..

2. Set the parameters according to Table 9.1.11.1.5-1 and 9.1.11.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.11.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

9.1.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.11.1.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.11.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.11.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.11.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.11.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.11.1.4.3-6: *SystemInformationBlockType2*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: Clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 1
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 9.1.11.1.4.3-7: *SystemInformationBlockType3*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.11.1.5 Test requirement

Table 9.1.11.1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.11.1.5-3.

Table 9.1.11.1.5-1: General test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [9].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

Table 9.1.11.1.5-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD) Note5			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s/N_{oc}$		dB	5	-2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.88	-2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.12	-5.54	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands TDD_A	dBm/15 kHz	-101	-108	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands TDD_C						-80.63	-84.37
	Bands TDD_E						-79.63	-83.37
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-71.41	-76.09	-53.54	-57.16	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7:	In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.11.1.5-3: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_25	RSRP_40	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	RSRP_40	RSRP_59	Bands TDD_A	RSRP_29
			Bands TDD_C	RSRP_30
			Bands TDD_E	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.11.1_1 TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward)

Editor's note: This test case is incomplete. The following item is missing or incomplete:

The test tolerances and test requirements for test 1, 2 and 3 in normal conditions are TBD

9.1.11.1_1.1 Test purpose

Same test purpose as in clause 9.1.11.1.1.

9.1.11.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.11.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.11.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.11.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.11.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.11.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.11.

9.1.11.1_1.4 Test description

9.1.11.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.11.1.4.1.

9.1.11.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.11.1.4.2 with the following exceptions:

- Instead of Table 9.1.11.1.5-1→ use Table 9.1.11.1_1.5-1.
- Instead of Table 9.1.11.1.5-2→ use Table 9.1.11.1_1.5-2.
- Instead of Table 9.1.11.1.5-3→ use Table 9.1.11.1_1.5-3.

9.1.11.1_1.4.3 Message contents

Same message contents as in clause 9.1.11.1.4.3.

9.1.11.1_1.5 Test requirement

Table 9.1.11.1_1.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.11.1_1.5-3.

Table 9.1.11.1_1.5-1: General test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [9].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

Table 9.1.11.1_1.5-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD) Note5			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s/N_{oc}$		dB	5+TT	-2+TT	5+TT	-3.05+TT	5+TT	-3.05+TT
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88+TT	-8.19+TT	3.54+TT	-10.19+TT	3.54+TT	-10.19+TT
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.88+TT	-2+TT	3.25+TT	-3.05+TT	3.25+TT	-3.05+TT
SCH $\hat{E}_s/I_{ot}$		dB	-1.12+TT	-5.54+TT	-0.75+TT	-6.59+TT	-0.75+TT	-6.59+TT
RSRP Note 3,4	Bands TDD_A	dBm/15 kHz	-101+TT	-108+TT	-83+TT	-91.05+TT	-111+TT	-119.05+TT
	Bands TDD_C						-110+TT	-118.05+TT
	Bands TDD_E						-109+TT	-117.05+TT
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-71.41+TT	-74.88+TT	-53.63+TT	-57.37+TT	-81.63+TT	-85.37+TT
	Bands TDD_C						-80.63+TT	-84.37+TT
	Bands TDD_E						-79.63+	-83.37+T

							TT	T
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-71.41+TT	-76.09+TT	-53.54+TT	-57.16+TT	-81.54+TT	-85.16+TT
	Bands TDD_C						-80.54+TT	-84.16+TT
	Bands TDD_E						-79.54+TT	-83.16+TT
Propagation condition			AWGN		AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port Note 5: Applies to restricted measurement subframes of the respective cell. Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1. Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4. Note 8: E-UTRA operating band groups are as defined in Section 3.5.								

Table 9.1.11.1_1.5-3: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	TBD	TBD	Bands TDD_A	TBD
			Bands TDD_C	TBD
			Bands TDD_E	TBD
Highest reported value (Cell 2)	TBD	TBD	Bands TDD_A	TBD
			Bands TDD_C	TBD
			Bands TDD_E	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 2)	RSRP_43	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.11.2 TDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.1.11.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy under time-domain measurement resource restriction with MBSFN ABS configured in the aggressor cell is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRP accuracy requirements.

9.1.11.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward supporting eICIC. Applicability requires support for FGI bit 115.

9.1.11.2.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.4.

The accuracy requirements in Table 9.1.11.2.3-1 for relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex I.3.1 for a corresponding Band

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.11.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 5	dBm/$BW_{Channel}$
±2	±3	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.11.

9.1.11.2.4 Test description

9.1.11.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.11.2.4.3.

4. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.11.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3..

2. Set the parameters according to Table 9.1.11.2.5-1 and 9.1.11.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.11.2.5-3.

If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

9.1.11.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.11.2.4.3-1: Common Exception message for RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.11.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.11.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.11.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.1.11.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.1.11.2.4.3-6: *SystemInformationBlockType2*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: Clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 1
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	‘010000’B	Subframe 4 is used for MBSFN	
}			
}			

Table 9.1.11.2.4.3-7: *SystemInformationBlockType3*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.1.11.2.5 Test requirement

Table 9.1.11.2.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.11.2.5-3.

Table 9.1.11.2.5-1: General test parameters for E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331 ,clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

Table 9.1.11.2.5-2: Cell-specific test parameters for E-UTRAN TDD RSRP intra-frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD) Note5			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note 2	Bands TDD_A	dBm/15 kHz	-106		-88		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s/N_{oc}$		dB	5	-1.2	5	-3.05	5	-3.05
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5, 7 in the 1st OFDM symbol		dB	2.88	-8.19	3.54	-10.19	3.54	-10.19
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.55	-1.2	3.25	-3.05	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.45	-4.74	-0.75	-6.59	-0.75	-6.59
RSRP Note 3,4	Bands TDD_A	dBm/15 kHz	-101	-107.2	-83	-91.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{Io})_{meas}$ Note 3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-71.41	-74.88	-53.63	-57.37	-81.63	-85.37
	Bands TDD_C						-80.63	-84.37
	Bands TDD_E						-79.63	-83.37
$(\mathrm{Io})_{meas}$ Note 3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-71.30	-76.09	-53.54	-58.76	-81.54	-86.47
	Bands TDD_C						-80.54	-85.47
	Bands TDD_E						-79.54	-84.47
Propagation condition			AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7:	In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in 9.1.2.3 and 9.1.2.4.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.11.2.5-3: E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-4	RSRP_x-4	RSRP_x-4
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 2)	RSRP_x-11	RSRP_x-13	RSRP_x-13
Highest reported value (Cell 2)	RSRP_x-3	RSRP_x-4	RSRP_x-4
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12 FDD RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.12.1.1 Test purpose

To verify that FDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier under bandwidth of 20MHz.

9.1.12.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.12.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.12.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|$_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.6.1.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.12.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.12.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.12

9.1.12.1.4 Test description

9.1.12.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.12.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.12.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCC is configured and activated. The absolute accuracy of RSRP is defined as the RSRP measured from the primary component carrier (Cell 1) and the RSRP measured from the secondary component carrier (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.12.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.12.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass (“Cell 1” and “Cell 2”), the test passes ofr each configuration (without and with switched PCell/SCell scenario). If one event fails, the test fails.

9.1.12.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.12.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.12.1.5 Test requirement

Table 9.1.12.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.12.1.5-2.

Table 9.1.12.1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.6.1.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.12.1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_12	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12.1_1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

9.1.12.1_1.1 Test purpose

Same test purpose as in clause 9.1.12.1.1.

9.1.12.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.12.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.12.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.12.1_1.3-1: RSRP FDD absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.12.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.12.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, and A.9.1.12.

9.1.12.1_1.4 Test description

9.1.12.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.12.1.4.1 with the following exceptions:

- Instead of 9.1.12.1.4.3 → use 9.1.12.1_1.4.3.

9.1.12.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.12.1.4.2 with the following exceptions:

- Instead of Table 9.1.12.1.5-1 → use Table 9.1.12.1_1.5-1.

- Instead of Table 9.1.12.1.5-2 → use Table 9.1.12.1_1.5-2.

9.1.12.1_1.4.3 Message contents

Same message contents as in clause 9.1.12.1.4.3.

9.1.12.1_1.5 Test requirement

Table 9.1.12.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.12.1_1.5-2.

Table 9.1.12.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Test 1</th></tr>
<tr><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">$BW_{channel}$ Note 1</td><td>MHz</td><td>20</td><td>20</td><td>20</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td colspan="3">47—52</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.1</td><td></td><td>R.4 FDD</td><td>R.4 FDD</td><td>N/A</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>38—61</td><td>38—61</td><td>N/A</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1</td><td></td><td colspan="3">R.10 FDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)</td><td></td><td>OP.11 FDD</td><td>OP.11 FDD</td><td>OP.12 FDD</td></tr>
<tr><td rowspan="7">Io Note2</td><td>Bands FDD_A Note 5</td><td rowspan="7">dBm/18 MHz</td><td>-84.75</td><td colspan="2" rowspan="7">(Io for Channel 1 +5.33dB)</td></tr>
<tr><td>Bands FDD_B Note 5</td><td>-84.25</td></tr>
<tr><td>Bands FDD_C Note 5</td><td>-83.75</td></tr>
<tr><td>Bands FDD_D Note 5</td><td>-83.25</td></tr>
<tr><td>Bands FDD_E Note 5</td><td>-82.75</td></tr>
<tr><td>Bands FDD_G Note 5</td><td>-81.75</td></tr>
<tr><td>Bands FDD_H Note 5</td><td>-81.25</td></tr>
<tr><td colspan="6">NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.1.6.1.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.</td></tr>
</table>

Table 9.1.12.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)	RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)	RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions							
Lowest reported value (Cell 1)	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.							

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.12.2.1 Test purpose

To verify that FDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and FDD relative RSRP accuracy of cells on the secondary component carriers.

9.1.12.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.12.2.3 Minimum conformance requirements

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.12.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.12.2.3-1: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 6	dBm/BW Channel
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
±3	±3	≥-6 dB	Note 4	Note 4	Note 4

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 6: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.

The requirements in Table 9.1.12.2.3-2 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.12.2.3-2: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 6	dBm/BW Channel
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
±3	±3	≥-6 dB	Note 4	Note 4	Note 4

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 6: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.12.

9.1.12.2.4 Test description

9.1.12.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.12.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.12.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.12.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.12.2.5-2. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.12.2.5-2. This counts respectively as a Pass or Fail for the events "Cell 1-2" and "Cell 2-3". If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event "Cell 1-2" / "Cell 2-3" is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events "Cell 1-2" and "Cell 2-3" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events ("Cell 1-2" and "Cell 2-3") pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.12.2.4.3 Message contents

Table 9.1.12.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.12.2.5 Test requirement

Table 9.1.12.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.12.2.5-2.

Table 9.1.12.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.6.2.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.12.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1+TT
Highest reported value (Cell 2)	RSRP_x + 17+TT
Lowest reported value (Cell 3)	RSRP_y – 8+TT
Highest reported value (Cell 3)	RSRP_y + 1+TT
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.12.2_1FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

9.1.12.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.12.2.1.

9.1.12.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.12.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.6.2_1.3.

9.1.12.2_1.4 Test description

9.1.12.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.12.2.4.1.

9.1.12.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.12.2.4.2 with the following exceptions:

- Instead of Table 9.1.12.2.5-1 → use Table 9.1.12.2_1.5-1.
- Instead of Table 9.1.12.2.5-2 → use Table 9.1.12.2_1.5-2.

9.1.12.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.12.2.4.3.

9.1.12.2_1.5 Test requirement

Table 9.1.12.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.12.2_1.5-2.

Table 9.1.12.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter	Unit	Test 1		
		Cell 1	**Cell 2**	**Cell 3**

$BW_{channel}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD		
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands FDD_B Note 5		-84.25		
	Bands FDD_C Note 5		-83.75		
	Bands FDD_D Note 5		-83.25		
	Bands FDD_E Note 5		-82.75		
	Bands FDD_G Note 5		-81.75		
	Bands FDD_H Note 5		-81.25		
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.6.2.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.12.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x +2
Highest reported value (Cell 2)	RSRP_x +15
Lowest reported value (Cell 3)	RSRP_y - 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13 TDD RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.13.1.1 Test purpose

To verify that TDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier under bandwidth of 20MHz.

9.1.13.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.13.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.13.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.13.1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions				
Normal condition	**Extreme condition**	**Ês/Iot**	**Io Note 1 range**			
			E-UTRA operating band groups Note 3	**Minimum Io**		**Maximum Io**
dB	**dB**	**dB**		**dBm/15kHz Note 2**	**dBm/$BW_{Channel}$**	**dBm/$BW_{Channel}$**
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.13.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.13.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1,clause 9.1.11.2 clause 9.1.4 and A.9.1.13.

9.1.13.1.4 Test description

9.1.13.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.13.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.13.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCC is configured and activated. The absolute accuracy of RSRP is defined as the RSRP measured from the primary component carrier (Cell 1) and the RSRP measured from the secondary component carrier (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.13.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table

9.1.13.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.1.13.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.13.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.13.1.5 Test requirement

Table 9.1.13.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.13.1.5-2.

Table 9.1.13.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.1.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.13.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The Test tolerances applicable to this test are undefined

9.1.13.1_1.1 Test purpose

Same test purpose as in clause 9.1.13.1.1

9.1.13.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.13.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.13.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.13.1_1.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.13.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.13.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1,clause 9.1.11.2 clause 9.1.4 and A.9.1.13.

9.1.13.1_1.4 Test description

9.1.13.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.13.1.4.1 with the following exceptions:

- Instead of 9.1.13.1.4.3 → use 9.1.13.1_1.4.3.

9.1.13.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.13.1.4.2 with the following exceptions:

- Instead of Table 9.1.13.1.5-1 → use Table 9.1.13.1_1.5-1.
- Instead of Table 9.1.13.1.5-2 → use Table 9.1.13.1_1.5-2.

9.1.13.1_1.4.3 Message contents

Same message contents as in clause 9.1.13.1.4.3

9.1.13.1_1.5 Test requirement

Table 9.1.13.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.13.1_1.5-2.

Table 9.1.13.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		
[NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.] NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.13.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Bands TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	TBD	TBD	TBD
Highest reported value (Cell 1)	TBD	TBD	TBD
Lowest reported value (Cell 2)	TBD	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD	TBD
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz

9.1.13.2.1 Test purpose

To verify that TDD relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRP accuracy requirements of cells between the primary and secondary component carrier and TDD relative RSRP accuracy of cells on the secondary component carriers.

9.1.13.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.13.2.3 Minimum conformance requirements

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.13.2.3-1 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.13.2.3-1: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4 and A.9.1.13.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.13.2.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.13.2.3-2: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, 9.1.11.3, clause 9.1.4 and A.9.1.13.

9.1.13.2.4 Test description

9.1.13.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.13.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.13.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.1.13.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.13.2.5-2. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.13.2.5-2. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”. If the UE fails to report the measurement value for Cell 2 / Cell 3, the number of failed iterations for the respective affected event “Cell 1-2” / ”Cell 2-3” is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.1.13.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.13.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.13.2.5 Test requirement

Table 9.1.13.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.13.2.5-2.

Table 9.1.13.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75		
	Bands TDD_E Note 5		-82.75		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.13.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.13.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)

Editor's note: This Test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Test requirements in normal conditions need to be defined*

9.1.13.2_1.1 Test purpose

Same test purpose as defined in clause 9.1.13.2.1.

9.1.13.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.13.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.13.2_1.4 Test description

9.1.13.2_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.13.2.4.1 with the following exceptions:

- Instead of Table 9.1.13.2.5-1 → use Table 9.1.13.2_1.5-1.
- Instead of Table 9.1.13.2.5-2 → use Table 9.1.13.2_1.5-2.

9.1.13.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.13.2.4.2.

9.1.13.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.13.2.4.3.

9.1.13.2_1.5 Test requirement

Table 9.1.13.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.13.2_1.5-2.

Table 9.1.13.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20		
Measurement bandwidth		n_{PRB}	47—52		
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	N/A
PDSCH allocation		n_{PRB}	38—61	38—61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD		
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-84.75+TT	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-83.75+TT		
	Bands TDD_E Note 5		-82.75+TT		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.1.13.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	TBD
Highest reported value (Cell 2)	TBD
Lowest reported value (Cell 3)	TBD
Highest reported value (Cell 3)	TBD
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.14 FDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.14.1.1 Test purpose

To verify that the Absolute RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.14.1.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11. Applicability requires support of FGI bit 115.

9.1.14.1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.14.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.14.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range			
			E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol. NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.14.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.14.

9.1.14.1.4 Test description

9.1.14.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.14.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.14.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.14.1.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
DRX				OFF
Cell 2 time offset with respect to Cell 1			0µs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 µs	Synchronous cells
Physical cell ID PCI			Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'1000000010000000100000001000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the PCell subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'1000000010000000100000001000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'0100000001000000010000000100000001000000'	Configured for measurements on Cell 1.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.14.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.14.1.4.1-1 and Table 9.1.14.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.14.1.4.1-1 and Table 9.1.14.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.14.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.14.1.5-1 as appropriate.

9.1.14.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.14.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.14.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.14.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.14.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000001000000010000001000000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.14.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.14.1.5 Test requirement

Table 9.1.14.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.14.1.5-2.

Table 9.1.14.1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	-	R.0 FDD	-	-	R.0 FDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106			-88			-116		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F Note 7								-114		
	Bands FDD_G								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-1.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.18	-0.32	-6.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-102	-104	-107.5	-84	-86	-91	-112	-114	-119
	Bands FDD_C								-111	-113	-118
	Bands FDD_D								-110.5	-112.5	-117.5
	Bands FDD_E, FDD_F Note 7								-110	-112	-117
	Bands FDD_G								-109	-111	-116
	Bands FDD_H								-108.5	-110.5	-115.5
$(\mathrm{Io})_{meas}$ Note 3,5	Bands FDD_A	dBm/9 MHz	-70.58	-74.43		-52.74	-56.83		-80.74	-84.83	
	Bands FDD_C								-79.74	-83.83	
	Bands FDD_D								-79.24	-83.33	
	Bands FDD_E, FDD_F Note 7								-78.74	-82.83	
	Bands FDD_G								-77.74	-81.83	
	Bands FDD_H								-77.24	-81.33	
Propagation condition			AWGN			AWGN			AWGN		

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	E-UTRA operating band groups are as defined in TS 36.133Section 3.5.

Table 9.1.14.1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 3)	RSRP_25	RSRP_40	Bands FDD_A	RSRP_14
			Bands FDD_C	RSRP_15
			Bands FDD_D	RSRP_15
			Bands FDD_E, FDD_F	RSRP_16
			Bands FDD_G	RSRP_17
			Bands FDD_H	RSRP_17
Highest reported value (Cell 3)	RSRP_41	RSRP_59	Bands FDDA	RSRP_29
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_31
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_33
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.14.1_1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward)

Editor's note: This test case is incomplete. The following item is missing or incomplete:

The test tolerances and test requirements for test 1, 2 and 3 in normal conditions are TBD

9.1.14.1_1.1 Test purpose

Same test purpose as in clause 9.1.14.1.1.

9.1.14.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 12 and forward. Applicability requires support of FGI bit 115.

9.1.14.1_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.14.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.14.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
			Io Note 2 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.14.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.14.

9.1.14.1_1.4 Test description

9.1.14.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.14.1.4.1.

9.1.14.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.14.1.4.2 with the following exceptions:

- Instead of Table 9.1.14.1.5-1→ use Table 9.1.14.1_1.5-1.
- Instead of Table 9.1.14.1.5-2→ use Table 9.1.14.1_1.5-2.

9.1.14.1_1.4.3 Message contents

Same message contents as in clause 9.1.14.1.4.3.

9.1.14.1_1.5 Test requirement

Table 9.1.14.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.14.1_1.5-2.

Table 9.1.14.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter	Unit	Test 1			Test 2			Test 3		
		Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3

E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	-	R.0 FDD	-	-	R.0 FDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in A.3.2.1.5 (OP.5 FDD) and A.3.2.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA											
PHICH_RB											
PDCCH_RA											
PDCCH_RB											
PDSCH_RA											
PDSCH_RB											
OCNG_RA Note1											
OCNG_RB Note1											
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106			-88			-116		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F Note 7								-114		
	Bands FDD_G Note 9								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4+TT	2+TT	-1.5+TT	4+TT	2+TT	-4+TT	4+TT	2+TT	-4+TT
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.18+TT	-0.32+TT	-6.96+TT	-0.75+TT	0.54+TT	-9.46+TT	-0.75+TT	0.54+TT	-9.46+TT
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-102+TT	-104+TT	-107.5+TT	-84+TT	-86+TT	-92+TT	-112+TT	-114+TT	-120+TT
	Bands FDD_C								-111+TT	-113+TT	-119+TT
	Bands FDD_D								-110.5+TT	-112.5+TT	-118.5+TT
	Bands FDD_E, FDD_F Note 7								-110+TT	-112+TT	-118+TT
	Bands FDD_G Note 9								-109+TT	-111+TT	-117+TT
	Bands FDD_H								-108.5+TT	-110.5+TT	-116.5+TT
$(\mathrm{Io})_{meas}$ Note 3,5	Bands FDD_A	dBm/9 MHz	-70.58+TT	-74.43+TT		-52.82+TT	-57.04+TT		-80.82+TT	-85.04+TT	
	Bands FDD_C								-79.82+TT	-84.04+TT	

	Bands FDD_D						-79.32+TT	-83.54+TT
	Bands FDD_E, FDD_F Note 7						-78.82+TT	-83.04+TT
	Bands FDD_G Note 9						-77.82+TT	-82.04+TT
	Bands FDD_H						-77.32+TT	-81.54+TT
Propagation condition			AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table A.3.4.1.1-1.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9: Except Band 29 and Band 32.

Table 9.1.14.1_1.5-2: E-UTRAN RSRP FDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 3)	TBD	TBD	Bands FDD_A	TBD
			Bands FDD_C	TBD
			Bands FDD_D	TBD
			Bands FDD_E, FDD_F	TBD
			Bands FDD_G	TBD
			Bands FDD_H	TBD
Highest reported value (Cell 3)	TBD	TBD	Bands FDDA	TBD
			Bands FDD_C	TBD
			Bands FDD_D	TBD
			Bands FDD_E, FDD_F	TBD
			Bands FDD_G	TBD
			Bands FDD_H	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands FDD_A	RSRP_11
			Bands FDD_C	RSRP_12
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_13
			Bands FDD_G	RSRP_14
			Bands FDD_H	RSRP_14
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.14.2.1 Test purpose

To verify that the Relative RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.14.2.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.1.14.2.3 Minimum conformance requirements

The FDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.14.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.14.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 5	dBm/BWChannel
±2	±3	≥-2 dB	FDD_A	-121	-50
			FDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.14.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.14.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.14.

9.1.14.2.4 Test description

9.1.14.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.14.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.14.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.14.2.4.1-1: General test parameters for E-UTRAN FDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
DRX				OFF
Cell 2 time offset with respect to Cell 1			0µs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 µs	Synchronous cells
Physical cell ID PCI			Colliding CRS: $(PCI_{cell1} – PCI_{cell3})mod6=0$, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: $(PCI_{cell2} – PCI_{cell3})mod6 !=0$	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'1000000010000000100000001000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the PCell subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'1000000010000000100000001000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'0100000001000000010000000100000001000000'	Configured for measurements on Cell 1.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.14.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.14.2.4.1-1 and Table 9.1.14.2.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.14.2.4.1-1 and Table 9.1.14.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.14.2.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.14.2.5-1 as appropriate.

9.1.14.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.14.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.14.2.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.14.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

Table 9.1.14.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000001000000010000000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.1.14.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.14.2.5 Test requirement

Table 9.1.14.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.14.2.5-2.

Table 9.1.14.2.5-1: Cell Specific test parameters for E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	-	R.0 FDD	-	-	R.0 FDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106			-88			-116		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F Note 7								-114		
	Bands FDD_G								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-0.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.41	-0.77	-5.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-102	-104	-106.5	-84	-86	-91	-112	-114	-119
	Bands FDD_C								-111	-113	-118
	Bands FDD_D								-110.5	-112.5	-117.5
	Bands FDD_E, FDD_F Note 7								-110	-112	-117
	Bands FDD_G								-109	-111	-116
	Bands FDD_H								-108.5	-110.5	-115.5
$(\mathrm{Io})_{meas}$ Note 3,5	Bands FDD_A	dBm/9 MHz	70.45	-74.11		52.74	-56.83		-80.74	-84.83	
	Bands FDD_C								-79.74	-83.83	
	Bands FDD_D								-79.24	-83.33	
	Bands FDD_E, FDD_F Note 7								-78.74	-82.83	
	Bands FDD_G								-77.74	-81.83	
	Bands FDD_H								-77.24	-81.33	
Propagation condition			AWGN			AWGN			AWGN		

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	E-UTRA operating band groups are as defined in TS 36.133Section 3.5.

Table 9.1.14.2.5-2: E-UTRAN RSRP FDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 3)	RSRP_x-8	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-2	RSRP_x-3	RSRP_x-3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 3)	RSRP_x-9	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-1	RSRP_x-3	RSRP_x-3
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.15 TDD RSRP under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.15.1.1 Test purpose

To verify that the Absolute RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.15.1.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11. Applicability requires support of FGI bit 115.

9.1.15.1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.15.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP|$_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.15.1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
			Io Note 2 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±6	±9	≥-4 dB	TDD_A	-121	N/A	-70
			TDD_C	-120	N/A	-70
			TDD_E	-119	N/A	-70
±8	±11	≥-4 dB	TDD_A, TDD_C, TDD_E	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.15.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.15.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.15.

9.1.15.1.4 Test description

9.1.15.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.15.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.15.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.15.1.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Value</th><th>Comment</th></tr>
<tr><td colspan="2">Serving cell (PCell)</td><td></td><td>Cell 1</td><td>The aggressor cell to Cell 3</td></tr>
<tr><td colspan="2">Neighbour cell</td><td></td><td>Cell 2</td><td>The aggressor cell to Cell 3</td></tr>
<tr><td colspan="2">Neighbour cell</td><td></td><td>Cell 3</td><td>Cell to be measured</td></tr>
<tr><td colspan="2">PCell ABS configuration</td><td></td><td>Non-MBSFN ABS</td><td>As defined in Table C.3.1.1.1-1</td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td>For three cells in the test</td></tr>
<tr><td colspan="2">Special subframe configuration</td><td></td><td>6</td><td>As specified in table 4.2-1 in TS 36.211. The same configuration in both cells</td></tr>
<tr><td colspan="2">Uplink-downlink configuration</td><td></td><td>1</td><td>As specified in table 4.2-2 in TS 36.211. The same configuration in both cells</td></tr>
<tr><td colspan="2">DRX</td><td></td><td></td><td>OFF</td></tr>
<tr><td colspan="2">Cell 2 time offset with respect to Cell 1</td><td></td><td>0μs</td><td>Synchronous cells</td></tr>
<tr><td colspan="2">Cell 3 time offset with respect to Cell 1</td><td></td><td>-2.5 μs</td><td>Synchronous cells</td></tr>
<tr><td colspan="2">Physical cell ID PCI</td><td></td><td>Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0,
PCI_{cell1} not equal to PCI_{cell3}
Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0</td><td>Cell PCIs for three cells are selected randomly so that all conditions are met</td></tr>
<tr><td colspan="2">ABS pattern</td><td></td><td>'00000000010000000001'</td><td>TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54.
The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes.
Provided to the UE for Cell 1 and Cell 2 before the measurements start.</td></tr>
<tr><td colspan="2">Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1</td><td></td><td>'00000000010000000001'</td><td>Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5.
Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.</td></tr>
<tr><td colspan="2">Time-domain measurement resource restriction pattern for serving cell measurements</td><td></td><td>'10000000001000000000'</td><td>Configured for Cell 1 measurements.</td></tr>
<tr><td rowspan="3">CRS assistance information</td><td>physCellId</td><td rowspan="3"></td><td>see PCI conditions above</td><td rowspan="3">The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation one Frame='000000'.</td></tr>
<tr><td>antennaPortsCount</td><td>1</td></tr>
<tr><td>mbsfn-SubframeConfigList</td><td>oneFrame = '000000'</td></tr>
</table>

9.1.15.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.15.1.4.1-1 and Table 9.1.15.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP absolute accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.15.1.4.1-1 and Table 9.1.15.1.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.15.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.15.1.5-1 as appropriate.

9.1.15.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.15.1.4.3-1: Common Exception messages for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.15.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.15.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 3	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.15.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	‘10000000001000000000’	BIT STRING (SIZE (20))	
}			
}			
}			

Table 9.1.15.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.15.1.5 Test requirement

Table 9.1.15.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.15.1.5-2.

Table 9.1.15.1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	-	R.0 TDD	-	-	R.0 TDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2			OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA		dB	Note 6		0	Note 6		0	Note 6		0
PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA											
PHICH_RB											
PDCCH_RA											
PDCCH_RB											
PDSCH_RA											
PDSCH_RB											
OCNG_RA Note1											
OCNG_RB Note1											
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106			-88			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-1.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.18	-0.32	-6.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-102	-104	-107.5	-84	-86	-91	-112	-114	-119
	Bands TDD_C								-111	-113	-118
	Bands TDD_E								-110	-112	-117
$(\mathrm{Io})_{meas}$ Note 3, 5	Bands TDD_A	dBm/9 MHz	-70.58	-74.43		-52.74	-56.83		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	
Propagation condition			AWGN			AWGN			AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

Table 9.1.15.1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 3)	RSRP_25	RSRP_40	Bands TDD_A	RSRP_14
			Bands TDD_C	RSRP_15
			Bands TDD_E	RSRP_16
Highest reported value (Cell 3)	RSRP_41	RSRP_59	Bands TDD_A	RSRP_29
			Bands TDD_C	RSRP_30
			Bands TDD_E, FDD_F	RSRP_31
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33
			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.15.1_1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward)

Editor's note: This test case is incomplete. The following item is missing or incomplete:

The test tolerances and test requirements for test 1, 2 and 3 in normal conditions are TBD

9.1.15.1_1.1 Test purpose

Same test purpose as in clause 9.1.15.1.1.

9.1.15.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 12 and forward. Applicability requires support of FGI bit 115.

9.1.15.1_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.3.

The accuracy requirements in table 9.1.15.1_1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$\mathrm{RSRP}|_{\mathrm{dBm}}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.15.1_1.3-1: RSRP Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions				
			Io Note 2 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 3	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-4 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-4 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.15.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.15.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.3, clause 9.1.4 and A.9.1.15.

9.1.15.1_1.4 Test description

9.1.15.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.15.1.4.1.

9.1.15.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.15.1.4.2 with the following exceptions:

- Instead of Table 9.1.15.1.5-1→ use Table 9.1.15.1_1.5-1
- Instead of Table 9.1.15.1.5-2→ use Table 9.1.15.1_1.5-2

9.1.15.1_1.4.3 Message contents

Same message contents as in clause 9.1.15.1.4.3.

9.1.15.1_1.5 Test requirement

Table 9.1.15.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.15.1_1.5-2.

Table 9.1.15.1_1.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Test 1</th><th colspan="3">Test 2</th><th colspan="3">Test 3</th></tr>
<tr><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td colspan="3">1</td><td colspan="3">1</td><td colspan="3">1</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td>MHz</td><td colspan="3">10</td><td colspan="3">10</td><td colspan="3">10</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td colspan="3">22—27</td><td colspan="3">22—27</td><td colspan="3">22—27</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.2</td><td></td><td>R.0 TDD</td><td>-</td><td>-</td><td>R.0 TDD</td><td>-</td><td>-</td><td>R.0 TDD</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13—36</td><td>-</td><td>-</td><td>13—36</td><td>-</td><td>-</td><td>13—36</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td colspan="3">R.6 TDD</td><td colspan="3">R.6 TDD</td><td colspan="3">R.6 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.6 (OP.6 TDD)</td><td></td><td>OP.5 TDD</td><td>OP.6 TDD</td><td>OP.6 TDD</td><td>OP.5 TDD</td><td>OP.6 TDD</td><td>OP.6 TDD</td><td>OP.5 TDD</td><td>OP.6 TDD</td><td>OP.6 TDD</td></tr>
<tr><td colspan="2">PBCH_RA</td><td rowspan="13">dB</td><td colspan="2" rowspan="13">Note 6</td><td rowspan="13">0</td><td colspan="2" rowspan="13">Note 6</td><td rowspan="13">0</td><td colspan="2" rowspan="13">Note 6</td><td rowspan="13">0</td></tr>
<tr><td colspan="2">PBCH_RB</td></tr>
<tr><td colspan="2">PSS_RA</td></tr>
<tr><td colspan="2">SSS_RA</td></tr>
<tr><td colspan="2">PCFICH_RB</td></tr>
<tr><td colspan="2">PHICH_RA</td></tr>
<tr><td colspan="2">PHICH_RB</td></tr>
<tr><td colspan="2">PDCCH_RA</td></tr>
<tr><td colspan="2">PDCCH_RB</td></tr>
<tr><td colspan="2">PDSCH_RA</td></tr>
<tr><td colspan="2">PDSCH_RB</td></tr>
<tr><td colspan="2">OCNG_RA Note1</td></tr>
<tr><td colspan="2">OCNG_RB Note1</td></tr>
<tr><td rowspan="3">N_{oc} Note2</td><td>Bands TDD_A</td><td rowspan="3">dBm/15 kHz</td><td colspan="3" rowspan="3">-106</td><td colspan="3" rowspan="3">-88</td><td colspan="3">-116</td></tr>
<tr><td>Bands TDD_C</td><td colspan="3">-115</td></tr>
<tr><td>Bands TDD_E</td><td colspan="3">-114</td></tr>
</table>

CRS $\hat{E}_s / N_{oc}$		dB	4+TT	2+TT	-1.5+TT	4+TT	2+TT	-3+TT	4+TT	2+TT	-3+TT
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.18+TT	-0.32+TT	-6.96+TT	-0.89+TT	0.24+TT	-8.46+TT	-0.89+TT	0.24+TT	-8.46+TT
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-102+TT	-104+TT	-107.5+TT	-84+TT	-86+TT	-91+TT	-112+TT	-114+TT	-119+TT
	Bands TDD_C								-111+TT	-113+TT	-118+TT
	Bands TDD_E								-110+TT	-112+TT	-117+TT
$(\mathrm{Io})_{meas}$ Note 3, 5	Bands TDD_A	dBm/9 MHz	-70.58	-74.43+TT		-52.74+TT	-56.83+TT		-80.74+TT	-84.83+TT	
	Bands TDD_C								-79.74+TT	-83.83+TT	
	Bands TDD_E								-78.74+TT	-82.83+TT	
Propagation condition			AWGN			AWGN			AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

Table 9.1.15.1_1.5-2: E-UTRAN RSRP TDD absolute accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 3)	TBD	TBD	Bands TDD_A	TBD
			Bands TDD_C	TBD
			Bands TDD_E	TBD
Highest reported value (Cell 3)	TBD	TBD	Bands TDD_A	TBD
			Bands TDD_C	TBD
			Bands TDD_E, FDD_F	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 3)	RSRP_22	RSRP_37	Bands TDD_A	RSRP_11
			Bands TDD_C	RSRP_12
			Bands TDD_E	RSRP_13
Highest reported value (Cell 3)	RSRP_44	RSRP_62	Bands TDD_A	RSRP_32
			Bands TDD_C	RSRP_33

			Bands TDD_E	RSRP_34

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.1.15.2.1 Test purpose

To verify that the Relative RSRP measurement accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS configured in the aggressor cells is within the specified limits.

9.1.15.2.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.1.15.2.3 Minimum conformance requirements

The TDD RSRP measurements of cells shall meet the intra frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.4.

The accuracy requirements in table 9.1.15.2.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band.

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRP measurement,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.1.15.2.3-1: RSRP Intra frequency relative accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 3 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 5	dBm/BW_{Channel}
±2	±3	≥-2 dB	TDD_A	-121	-50
			TDD_C	-120	-50
			TDD_E	-119	-50
±3	±3	≥-4 dB	Note 4	Note 4	Note 4

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRP measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 [4] Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.15.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.15.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.4, clause 9.1.4 and A.9.1.15.

9.1.15.2.4 Test description

9.1.15.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.1.15.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.1.15.2.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 3, Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy, whilst both Cell 1 and Cell 3 are measured for RSRP relative accuracy. Non-MBSFN ABS pattern is configured for Cell 1 and Cell 2 during the test. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.1.15.2.4.1-1: General test parameters for E-UTRAN TDD RSRP intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Value	Comment
Serving cell (PCell)			Cell 1	The aggressor cell to Cell 3
Neighbour cell			Cell 2	The aggressor cell to Cell 3
Neighbour cell			Cell 3	Cell to be measured
PCell ABS configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For three cells in the test
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
DRX				OFF
Cell 2 time offset with respect to Cell 1			0µs	Synchronous cells
Cell 3 time offset with respect to Cell 1			-2.5 µs	Synchronous cells
Physical cell ID PCI			Colliding CRS: (PCI_{cell1} – PCI_{cell3})mod6=0, PCI_{cell1} not equal to PCI_{cell3} Non-colliding CRS: (PCI_{cell2} – PCI_{cell3})mod6 !=0	Cell PCIs for three cells are selected randomly so that all conditions are met
ABS pattern			'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the PCell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2 before the measurements start.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured before the measurements start. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'10000000001000000000'	Configured for Cell 1 measurements.
CRS assistance information	physCellId		see PCI conditions above	The CRS assistance information is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.1.15.2.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The relative accuracy of RSRP intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.1.15.2.4.1-1 and Table 9.1.15.2.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell 1 and Cell 2. Cell 1 is the serving cell and also the aggressor cell to Cell 3. Cell 2 is the neighbour aggressor cell without CRS colliding to Cell 3. Cell 3 is the cell to be measured for RSRP relative accuracy.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Tables 9.1.15.2.4.1-1 and Table 9.1.15.2.5-1. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 3 are compared to the actual RSRP values according to Table 9.1.15.2.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.15.2.5-1 as appropriate.

9.1.15.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.1.15.2.4.3-1: Common Exception messages for RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3a Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.1.15.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.15.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 3	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.15.2.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 5.2A.5, Table 5.2A.5.1.1-2 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			

Table 9.1.15.2.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRP TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 3		
range	Not present		
}			
}			
}			
}			

9.1.15.2.5 Test requirement

Table 9.1.15.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the reported values test requirements in table 9.1.15.2.5-2.

Table 9.1.15.2.5-1: Cell Specific test parameters for E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with CRS Assistance Information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	-	R.0 TDD	-	-	R.0 TDD	-	-
PDSCH allocation		n_{PRB}	13—36	-	-	13—36	-	-	13—36	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2			OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA		dB	Note 6		0	Note 6		0	Note 6		0
PBCH_RB											
PSS_RA											
SSS_RA											
PCFICH_RB											
PHICH_RA											
PHICH_RB											
PDCCH_RA											
PDCCH_RB											
PDSCH_RA											
PDSCH_RB											
OCNG_RA Note1											
OCNG_RB Note1											
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-106			-88			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s / N_{oc}$		dB	4	2	-0.5	4	2	-3	4	2	-3
CRS $\left(\hat{E}_s / I_{ot}\right)_{meas}$ Note 5		dB	-1.41	-0.77	-5.96	-0.89	0.24	-8.46	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-102	-104	-106.5	-84	-86	-91	-112	-114	-119
	Bands TDD_C								-111	-113	-118
	Bands TDD_E								-110	-112	-117
$(\mathrm{Io})_{meas}$ Note 3, 5	Bands TDD_A	dBm/9 MHz	-70.45	-74.11		-52.74	-56.83		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	
Propagation condition			AWGN			AWGN			AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.

Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Note 7: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

Table 9.1.15.2.5-2: E-UTRAN RSRP TDD relative accuracy under time-domain measurement resource restriction with non-MBSFN ABS requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 3)	RSRP_x-8	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-2	RSRP_x-3	RSRP_x-3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3 All bands**
Lowest reported value (Cell 3)	RSRP_x-9	RSRP_x-12	RSRP_x-12
Highest reported value (Cell 3)	RSRP_x-1	RSRP_x-3	RSRP_x-3
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.16 FDD Intra frequency RSRP Accuracy for 5MHz Bandwidth

9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth

9.1.16.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for Band 31.

9.1.16.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11 that support Band 31. Applicability requires support for FGI bit 16.

9.1.16.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.16.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.16.1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in section 3.5.1.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.16.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.16.

9.1.16.1.4 Test description

9.1.16.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.1.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.16.1.4.2 Test procedure

Same test procedure as defined in clause 9.1.1.1.4.2 with the following exceptions:

- Instead of Table 9.1.1.1.5-2 → use Table 9.1.16.1.5-1.
- Instead of Table 9.1.1.1.5-3 → use Table 9.1.16.1.5-2.

9.1.16.1.4.3 Message contents

Same message contents as defined in clause 9.1.1.1.4.3.

9.1.16.1.5 Test requirement

Table 9.1.16.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.16.1.5-2.

Table 9.1.16.1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	0	0	0	0	0	0
N_{oc} [Note2]	Band 31	dBm/15 kHz	-104		-84		-109.5	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note3]	Band 31	dBm/15 kHz	-98.0	-102.0	-78.0	-82.0	-106.5	-109.7
Io[Note3]	Band 31	dBm/4.5 MHz	-71.06		-51.06		-78.76	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.16.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values for 5MHz bandwidth

Normal Conditions	Test 1	Test 2	Test 3
Lowest reported value (Cell 2)	RSRP_31	RSRP_49	RSRP_23
Highest reported value (Cell 2)	RSRP_46	RSRP_68	RSRP_38
Extreme Conditions	**Test 1**	**Test 2**	**Test 3**
Lowest reported value (Cell 2)	RSRP_28	RSRP_46	RSRP_20
Highest reported value (Cell 2)	RSRP_49	RSRP_71	RSRP_41

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)

9.1.16.1_1.1 Test purpose

Same test purpose as in clause 9.1.16.1.1.

9.1.16.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support Band 31. Applicability requires support for FGI bit 16.

9.1.16.1_1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.16.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.16.1_1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in section 3.5.1.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.16.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.16.

9.1.16.1_1.4 Test description

9.1.16.1_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.1.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.16.1_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.1.1.4.2 with the following exceptions:

- Instead of Table 9.1.1.1.5-2 → use Table 9.1.16.1_1.5-1.
- Instead of Table 9.1.1.1.5-3 → use Table 9.1.16.1_1.5-2.

9.1.16.1_1.4.3 Message contents

Same message contents as defined in clause 9.1.1.1.4.3.

9.1.16.1_1.5 Test requirement

Table 9.1.16.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.16.1_1.5-2.

Table 9.1.16.1_1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Band 31	dBm/15 kHz	-104		-84		-109.5	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Band 31	dBm/15 kHz	-98.0	-102.0	-78.0	-82.0	-106.5	-109.7
Io Note3	Band 31	dBm/4.5 MHz	-71.06		-51.06		-78.76	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.16.1_1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values for 5MHz bandwidth

Normal Conditions	Test 1	Test 2	Test 3
Lowest reported value (Cell 2)	RSRP_32	RSRP_49	RSRP_25
Highest reported value (Cell 2)	RSRP_45	RSRP_68	RSRP_37
Extreme Conditions	**Test 1**	**Test 2**	**Test 3**
Lowest reported value (Cell 2)	RSRP_28	RSRP_46	RSRP_20
Highest reported value (Cell 2)	RSRP_49	RSRP_71	RSRP_41

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth

9.1.16.2.1 Test purpose

To verify that the FDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for Band 31.

9.1.16.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support Band 31. Applicability requires support for FGI bit 16.

9.1.16.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.16.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{\text{dBm}}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.16.2.3-1: RSRP Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range: E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.16.

9.1.16.2.4 Test description

9.1.16.2.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.1.2.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.16.2.4.2 Test procedure

Same test procedure as defined in clause 9.1.1.2.4.2 with the following exceptions:

- Instead of Table 9.1.1.2.5-2 → use Table 9.1.16.2.5-1.
- Instead of Table 9.1.1.2.5-3 → use Table 9.1.16.2.5-2.

9.1.16.2.4.3 Message contents

Same message contents as defined in clause 9.1.1.2.4.3.

9.1.16.2.5 Test requirement

Table 9.1.16.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.16.2.5-2.

Table 9.1.16.2.5-1: RSRP FDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Band 31	dBm/15 kHz	-103		-84		-109.5	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note3	Band 31	dBm/15 kHz	-97.0	-101.0	-78.0	-82.0	-106.5	-109.5
Io Note3	Band 31	dBm/4.5 MHz	-70.06		-51.06		-78.71	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	0
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.16.2.5-2: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17 FDD Inter frequency RSRP Accuracy for 5MHz Bandwidth

9.1.17.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth

9.1.17.1.1 Test purpose

To verify that the FDD inter-frequency absolute RSRP measurement accuracy for 5MHz Bandwidth is within the specified limit.

9.1.17.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11 that support Band 31. Applicability requires support for FGI bits 16 and 25.

9.1.17.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.17.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.17.1-1: RSRP Inter frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.17.

9.1.17.1.4 Test description

9.1.17.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.3.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.17.1.4.2 Test procedure

Same test procedure as defined in clause 9.1.3.1.4.2 with the following exceptions:

- Instead of Table 9.1.3.1.5-2 → use Table 9.1.17.1.5-1.
- Instead of Table 9.1.3.1.5-3 → use Table 9.1.17.1.5-2.

9.1.17.1.4.3 Message contents

Same message contents as defined in clause 9.1.3.1.4.3.

9.1.17.1.5 Test requirement

Table 9.1.17.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.17.1.5-2.

Table 9.1.17.1.5-1: RSRP FDD-FDD Inter frequency absolute accuracy test parameters for 5MHz Bandwidth

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10-15		10-15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0	0
N_{oc} Note2	Cell 2: Band 31	dBm/15 kHz	-86.25	-86.25	-102.5	-110.5
$\hat{E}_s/I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Band 31	dBm/15 kHz	-76.25	-76.25	-89.5	-113.7
Io Note3	Cell 2: Band 31	dBm/4.5 MHz	-51.06	-51.06	-64.52	-84.03
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
Note 7: This test is only applicable for testing inter-frequency requirements for Band 31.

Table 9.1.17.1.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values, 5MHz Bandwidth

Normal Conditions	Test 1 All bands	Test 2	
Lowest reported value (Cell 2)	RSRP_55	Cell 2: Band 31	RSRP_19
Highest reported value (Cell 2)	RSRP_74	Cell 2: Band 31	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Cell 2: Band 31	RSRP_16
Highest reported value (Cell 2)	RSRP_77	Cell 2: Band 31	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17.1_1 FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)

Editor's notes: This test case is incomplete. The following item is missing or incomplete:

- Test requirements for Test2 in normal conditions are TBD.

9.1.17.1_1.1 Test purpose

Same test purpose as in clause 9.1.17.1.1.

9.1.17.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support Band 31. Applicability requires support for FGI bits 16 and 25.

9.1.17.1_1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.17.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.3 for a corresponding Band.

Table 9.1.17.1_1.3-1: RSRP Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70

±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.17.

9.1.17.1_1.4 Test description

9.1.17.1_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.3.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.17.1_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.3.1.4.2 with the following exceptions:

- Instead of Table 9.1.3.1.5-2 → use Table 9.1.17.1_1.5-1.
- Instead of Table 9.1.3.1.5-3 → use Table 9.1.17.1_1.5-2.

9.1.17.1_1.4.3 Message contents

Same message contents as defined in clause 9.1.3.1.4.3.

9.1.17.1_1.5 Test requirement

Table 9.1.17.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.17.1_1.5-2.

Table 9.1.17.1_1.5-1: RSRP FDD-FDD Inter frequency absolute accuracy test parameters for 5MHz Bandwidth

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2

E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10-15		10-15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Cell 2: Band 31	dBm/15 kHz	-86.25	-86.25	-102.5	-110.5
$\hat{E}_s/I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Band 31	dBm/15 kHz	-76.25	-76.25	-89.5	-113.7
Io Note3	Cell 2: Band 31	dBm/4.5 MHz	-51.06	-51.06	-64.52	-84.03
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	
NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. NOTE 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. NOTE 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz. NOTE 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands. NOTE 7: This test is only applicable for testing inter-frequency requirements for Band 31.						

Table 9.1.17.1_1.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values, 5MHz Bandwidth

Normal Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_55	Cell 2: Band 31	TBD
Highest reported value (Cell 2)	RSRP_74	Cell 2: Band 31	TBD
Extreme Conditions	**Test 1 All bands**	**Test 2**	
Lowest reported value (Cell 2)	RSRP_52	Cell 2: Band 31	RSRP_16
Highest reported value (Cell 2)	RSRP_77	Cell 2: Band 31	RSRP_37

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth

9.1.17.2.1 Test purpose

To verify that the FDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for Band 31.

9.1.17.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE from release 8 to release 11 that support Band 31. Applicability requires support for FGI bits 16 and 25.

9.1.17.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.17.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.17.2.3-1: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.1.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.17.

9.1.17.2.4 Test description

9.1.17.2.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.3.2.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.1.17.2.4.2 Test procedure

Same test procedure as defined in clause 9.1.3.2.4.2 with the following exceptions:

- Instead of Table 9.1.3.2.5-2 → use Table 9.1.17.2.5-1.
- Instead of Table 9.1.3.2.5-3 → use Table 9.1.17.2.5-2.

9.1.17.2.4.3 Message contents

Same message contents as defined in clause 9.1.3.2.4.3.

9.1.17.2.5 Test requirement

Table 9.1.17.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.17.2.5-2.

Table 9.1.17.2.5-1: RSRP FDD - FDD Inter frequency relative accuracy test parameters for 5MHz bandwidth

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	5	5	5	5
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0	0
N_{oc} Note2	Cell 2: Band 31	dBm/15 kHz	-86.25	-86.25	-103.50	-110.50
$\hat{E}_s/I_{ot}$		dB	10	10	13	-3.2
RSRP Note3	Cell 2: Band 31	dBm/15 kHz	-76.25	-76.25	-90.50	-113.70
Io Note3	Cell 2: Band 31	dBm/4.5 MHz	-51.06	-51.06	-65.52	-84.03
$\hat{E}_s/N_{oc}$		dB	10	10	13	-3.2
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
Note 7: This test is only applicable for testing inter-frequency requirements for Band 31. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.

Table 9.1.17.2.5-2: RSRP FDD Inter frequency relative accuracy requirements for the 5MHz bandwidth for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.17.2_1 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth (Rel-12 and forward)

Editor's notes: This test case is incomplete. The following item is missing or incomplete:

- Test requirements for Test 1 and 2 in normal conditions are TBD

9.1.17.2_1.1 Test purpose

Same test purpose as in clause 9.1.17.2.1.

9.1.17.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward that support Band 31. Applicability requires support for FGI bits 16 and 25.

9.1.17.2_1.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.17.2_1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.17.2_1.3-1: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in section 3.5.1.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.16.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.17.

9.1.17.2_1.4 Test description

9.1.17.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.17.2.4.1.

9.1.17.2_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.17.2.4.2 with the following exceptions:

- Instead of Table 9.1.17.2.5-1 → use Table 9.1.17.2_1.5-1.
- Instead of Table 9.1.17.2.5-2 → use Table 9.1.17.2_1.5-2.

9.1.17.2_1.4.3 Message contents

Same message contents as defined in clause 9.1.17.2.4.3.

9.1.17.2_1.5 Test requirement

Table 9.1.17.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.17.2_1.5-2.

Table 9.1.17.2_1.5-1: RSRP FDD - FDD Inter frequency relative accuracy test parameters for 5MHz bandwidth

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number		1	2	1	2
$BW_{channel}$	MHz	5	5	5	5
Gap Pattern Id		0	-	0	-
Measurement bandwidth	n_{PRB}	10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1		R.5 FDD	-	R.5 FDD	-
PDSCH allocation	n_{PRB}	7—17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)		OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA	dB	0	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2 — Cell 2: Band 31	dBm/15 kHz	-86.25	-86.25	-103.50	-110.50
$\hat{E}_s/I_{ot}$	dB	10	10	13	-3.2
RSRP Note3 — Cell 2: Band 31	dBm/15 kHz	-76.25	-76.25	-90.50	-113.70
Io Note3 — Cell 2: Band 31	dBm/4.5 MHz	-51.06	-51.06	-65.52	-84.03
$\hat{E}_s/N_{oc}$	dB	10	10	13	-3.2
Propagation condition	-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
Note 7: This test is only applicable for testing inter-frequency requirements for Band 31. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.

Table 9.1.17.2_1.5-2: RSRP FDD Inter frequency relative accuracy requirements for the 5MHz bandwidth for the reported values

	Test 1 All bands	Test 2 All bands
Normal Conditions		
Lowest reported value (Cell 2)	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 9)	RSRP_(x - 32)
Highest reported value (Cell 2)	RSRP_(x + 9)	RSRP_(x - 16)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz

9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz

9.1.18.1.1 Test purpose

Same test purpose as in clause 9.1.6.1.1.

9.1.18.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 supporting CA.

9.1.18.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1.3.

9.1.18.1.4 Test description

9.1.18.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.18.1.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.18.1.4.2 Test procedure

Same test procedure as in clause 9.1.6.1.4.2 with the following exceptions:

- Instead of Table 9.1.6.1.5-2 → use Table 9.1.18.1.5-1.
- Instead of Table 9.1.6.1.5-3 → use Table 9.1.18.1.5-2.

9.1.18.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.18.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.18.1.5 Test requirement

Table 9.1.18.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.18.1.5-2.

Table 9.1.18.1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.32dB)	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.1.5-2 for the other parameters.

Table 9.1.18.1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.						

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18.1_1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The test tolerances applicable to this test are undefined

9.1.18.1_1.1 Test purpose

Same test purpose as in clause 9.1.18.1.1.

9.1.18.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.18.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1_1.3.

9.1.18.1_1.4 Test description

9.1.18.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.18.1.4.1 with the following exceptions:

- Instead of 9.1.18.1.4.3 → use 9.1.18.1_1.4.3.

9.1.18.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.18.1.4.2 with the following exceptions:

- Instead of Table 9.1.18.1.5-1 → use Table 9.1.18.1_1.5-1.
- Instead of Table 9.1.18.1.5-2 → use Table 9.1.18.1_1.5-2.

9.1.18.1_1.4.3 Message contents

Same message contents as in clause 9.1.18.1.4.3.

9.1.18.1_1.5 Test requirement

Table 9.1.18.1_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.18.1_1.5-2.

Table 9.1.18.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.32dB)	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.6.1.5-2 for the other parameters.					

Table 9.1.18.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	TBD	TBD	TBD	TBD	TBD	TBD
Highest reported value (Cell 1)	TBD	TBD	TBD	TBD	TBD	TBD
Lowest reported value (Cell 2)	TBD	TBD	TBD	TBD	TBD	TBD
Highest reported value (Cell 2)	TBD	TBD	TBD	TBD	TBD	TBD
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.						

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz

9.1.18.2.1 Test purpose

Same test purpose as in clause 9.1.6.2.1.

9.1.18.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 supporting CA.

9.1.18.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2.3.

9.1.18.2.4 Test description

9.1.18.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.18.2.4.3.

4. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.18.2.4.2 Test procedure

Same test procedure as in clause 9.1.6.2.4.2 with the following exceptions:

- Instead of Table 9.1.6.2.5-2 → use Table 9.1.18.2.5-1.
- Instead of Table 9.1.6.2.5-3 → use Table 9.1.18.2.5-2.

9.1.18.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.18.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.18.2.5 Test requirement

Table 9.1.18.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.18.2.5-2.

Table 9.1.18.2.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.50dB)	
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.6.2.5-2 for the other parameters.					

Table 9.1.18.2.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

9.1.18.2_1.1 Test purpose

Same test purpose as in clause 9.1.18.2.1.

9.1.18.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.18.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2_1.3.

9.1.18.2_1.4 Test description

9.1.18.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.18.2.4.1.

9.1.18.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.18.2.4.2 with the following exceptions:

- Instead of Table 9.1.18.2.5-1 → use Table 9.1.18.2_1.5-1.
- Instead of Table 9.1.18.2.5-2 → use Table 9.1.18.2_1.5-2.

9.1.18.2_1.4.3 Message contents

Same message contents as in clause 9.1.18.2.4.3

9.1.18.2_1.5 Test requirement

Table 9.1.18.2_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.18.2_1.5-2.

Table 9.1.18.2_1.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1 (FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
	Bands FDD_N		N/A		
RSRPNote2	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
	Bands FDD_N		N/A		
IoNote2	Bands FDD_A	dBm/9 MHz	-87.76	N/A	
	Bands FDD_B		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
	Bands FDD_A	dBm/4.5 MHz	N/A	(Io for Channel 1 +2.5dB)	
	Bands FDD_B				
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F				
	Bands FDD_G				
	Bands FDD_H				
	Bands FDD_N			-80.94	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.6.2.5-2 for the other parameters.					

Table 9.1.18.2_1.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x +2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz

9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz

9.1.19.1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.19.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 supporting CA.

9.1.19.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1.2.

9.1.19.1.4 Test description

9.1.19.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.19.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.19.1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.19.1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.19.1.5-2.

9.1.19.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.19.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.19.1.5 Test requirement

Table 9.1.19.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.19.1.5-2.

Table 9.1.19.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76	N/A	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
	Bands TDD_A	dBm/4.5MHz	N/A	(Io for Channel 1 +2.32dB)	
	Bands TDD_C				
	Bands TDD_E				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.1.5-1 for the other parameters.					

Table 9.1.19.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 10MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 2)	RSRP_30	RSRP_31	RSRP_32
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 1)	RSRP_35	RSRP_36	RSRP_37
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The Test system uncertainties applicable to this test are undefined

-The Test tolerances applicable to this test are undefined

-The cell configuration mapping for this test case is undefined in Annex E

-Test case applicability is still being discussed.

9.1.19.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1_1.1.

9.1.19.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.19.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1_1.3

9.1.19.1_1.4 Test description

9.1.19.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.19.1.4.1 with the following exceptions:

- Instead of 9.1.19.1.4.3 → use 9.1.19.1_1.4.3.

9.1.19.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1_1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1_1.5-1 → use Table 9.1.19.1_1.5-1.
- Instead of Table 9.1.7.1_1.5-2 → use Table 9.1.19.1_1.5-2.

9.1.19.1_1.4.3 Message contents

Same message contents as in clause 9.1.19.1.4.3

9.1.19.1_1.5 Test requirement

Table 9.1.19.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.19.1_1.5-2.

Table 9.1.19.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 10MHz + 5MHz

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Test 1</th></tr>
<tr><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">$BW_{channel}$ Note 1</td><td>MHz</td><td>10</td><td colspan="2">5</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>22-27</td><td colspan="2">10-15</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.2</td><td></td><td>R.0 TDD</td><td>R.5 TDD</td><td>N/A</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13-36</td><td>7-17</td><td>N/A</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td>R.6 TDD</td><td colspan="2">R.12 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.2 (TDD)</td><td></td><td>OP.1 TDD</td><td>OP.9 TDD</td><td>OP.10 TDD</td></tr>
<tr><td rowspan="6">Io Note2</td><td>Bands TDD_A</td><td rowspan="3">dBm/9 MHz</td><td>-87.76+TT</td><td colspan="2" rowspan="3">N/A</td></tr>
<tr><td>Bands TDD_C</td><td>-86.76+TT</td></tr>
<tr><td>Bands TDD_E</td><td>-85.76+TT</td></tr>
<tr><td>Bands TDD_A</td><td rowspan="3">dBm/4.5MHz</td><td rowspan="3">N/A</td><td colspan="2">-85.44+TT</td></tr>
<tr><td>Bands TDD_C</td><td colspan="2">-84.44+TT</td></tr>
<tr><td>Bands TDD_E</td><td colspan="2">-83.44+TT</td></tr>
<tr><td colspan="6">NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.1.7.1_1.5-1 for the other parameters.</td></tr>
</table>

Table 9.1.19.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 10MHz + 5MHz

<table>
<tr><th>Parameter</th><th colspan="3">Test 1</th></tr>
<tr><th>Band of Cell 1 on Primary Component Carrier</th><th>Bands TDD_A</th><th>Bands TDD_C</th><th>Band TDD_E</th></tr>
<tr><td colspan="4">Normal Conditions</td></tr>
<tr><td>Lowest reported value (Cell 1)</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td>Highest reported value (Cell 1)</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td>Lowest reported value (Cell 2)</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td>Highest reported value (Cell 2)</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td colspan="4">Extreme Conditions</td></tr>
<tr><td>Lowest reported value (Cell 1)</td><td>RSRP_xx</td><td>RSRP_xx</td><td>RSRP_xx</td></tr>
<tr><td>Highest reported value (Cell 1)</td><td>RSRP_xx</td><td>RSRP_xx</td><td>RSRP_xx</td></tr>
<tr><td>Lowest reported value (Cell 2)</td><td>RSRP_xx</td><td>RSRP_xx</td><td>RSRP_xx</td></tr>
<tr><td>Highest reported value (Cell 2)</td><td>RSRP_xx</td><td>RSRP_xx</td><td>RSRP_xx</td></tr>
<tr><td colspan="4">NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.</td></tr>
</table>

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz

9.1.19.2.1 Test purpose

Same test purpose as in clause 9.1.7.2.1.

9.1.19.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 supporting CA.

9.1.19.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.2.3.

9.1.19.2.4 Test description

9.1.19.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.19.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.19.2.4.2 Test procedure

Same test procedure as in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.5-1 → use Table 9.1.19.2.5-1.
- Instead of Table 9.1.7.2.5-2 → use Table 9.1.19.2.5-2.

9.1.19.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.19.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 10MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.19.2.5 Test requirement

Table 9.1.19.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.19.2.5-2.

Table 9.1.19.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76	N/A	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
	Bands TDD_A	dBm/4.5MHz	N/A	(Io for Channel 1 +2.50dB)	
	Bands TDD_C				
	Bands TDD_E				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters.					

Table 9.1.19.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)

9.1.19.2_1.1 Test purpose

Same test purpose as in clause 9.1.19.2.1.

9.1.19.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.19.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.19.2_1.4 Test description

9.1.19.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.19.2.4.1.

9.1.19.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.19.2.4.2 with the following exceptions:

- Instead of Table 9.1.19.2.5-1 → use Table 9.1.19.2_1.5-1.
- Instead of Table 9.1.19.2.5-2 → use Table 9.1.19.2_1.5-2.

9.1.19.2_1.4.3 Message contents

Same message contents as in clause 9.1.19.2.4.3

9.1.19.2_1.5 Test requirement

Table 9.1.19.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.19.2_1.5-2.

Table 9.1.19.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 10MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.5 TDD	N/A
PDSCH allocation		n_{PRB}	13-36	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.12 TDD	
OCNG Patterns defined in D.2 (TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9 MHz	-87.76	N/A	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
	Bands TDD_A	dBm/4.5MHz	N/A	(Io for Channel 1 +2.50dB)	
	Bands TDD_C				
	Bands TDD_E				
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters.					

Table 9.1.19.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 10MHz + 5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2 1
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20 FDD RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth

9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth

9.1.20.1.1 Test purpose

Same test purpose as in clause 9.1.6.1.1.

9.1.20.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.20.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1.3.

9.1.20.1.4 Test description

9.1.20.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.20.1.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.20.1.4.2 Test procedure

Same test procedure as in clause 9.1.6.1.4.2 with the following exceptions:

- Instead of Table 9.1.6.1.5-2 → use Table 9.1.20.1.5-1.
- Instead of Table 9.1.6.1.5-3 → use Table 9.1.20.1.5-2.

9.1.20.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.20.1.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz bandwidth

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.20.1.5 Test requirement

Table 9.1.20.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.20.1.5-2.

Table 9.1.20.1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_C Note 5		-89.76		
	Bands FDD_D Note 5		-89.26		
	Bands FDD_E, FDD_F Note 5		-88.76		
	Bands FDD_G Note 5		-87.76		
	Bands FDD_H Note 5		-87.26		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.20.1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1					
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_C**	**Band FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions						
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions						
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42

Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20.1_1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The test tolerances applicable to this test are undefined

9.1.20.1_1.1 Test purpose

Same test purpose as in clause 9.1.20.1.1.

9.1.20.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.20.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.1_1.3.

9.1.20.1_1.4 Test description

9.1.20.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.20.1.4.1 with the following exceptions:

- Instead of 9.1.20.1.4.3 → use 9.1.20.1_1.4.3.

9.1.20.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.20.1.4.2 with the following exceptions:

- Instead of Table 9.1.20.1.5-1 → use Table 9.1.20.1_1.5-1.
- Instead of Table 9.1.20.1.5-2 → use Table 9.1.20.1_1.5-2.

9.1.20.1_1.4.3 Message contents

Same message contents as in clause 9.1.20.1.4.3.

9.1.20.1_1.5 Test requirement

Table 9.1.20.1_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.20.1_1.5-2.

Table 9.1.20.1_1.5-1: RSRP FDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell 3

<table>
<tr><td colspan="2">BWchannel Note 1</td><td>MHz</td><td>5</td><td>5</td><td>5</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>10-15</td><td>10-15</td><td>10-15</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.1</td><td></td><td>R.0 FDD</td><td>R.5 FDD</td><td>N/A</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>7-17</td><td>7-17</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1</td><td></td><td>R.11 FDD</td><td>R.11 FDD</td><td>R.11 FDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)</td><td></td><td>OP.15 FDD</td><td>OP.15 FDD</td><td>OP.16 FDD</td></tr>
<tr><td rowspan="6">Io Note2</td><td>Bands FDD_A Note 5</td><td rowspan="6">dBm/4.5 MHz</td><td>-90.76</td><td colspan="2" rowspan="6">(Io for Channel 1 +5.33dB)</td></tr>
<tr><td>Bands FDD_C Note 5</td><td>-89.76</td></tr>
<tr><td>Bands FDD_D Note 5</td><td>-89.26</td></tr>
<tr><td>Bands FDD_E, FDD_F Note 5</td><td>-88.76</td></tr>
<tr><td>Bands FDD_G Note 5</td><td>-87.76</td></tr>
<tr><td>Bands FDD_H Note 5</td><td>-87.26</td></tr>
<tr><td colspan="6">Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.</td></tr>
</table>

Table 9.1.20.1_1.5-2: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

<table>
<tr><td></td><td colspan="5">**Test 1**</td><td></td></tr>
<tr><td>**Band of Cell 1 on Primary Component Carrier**</td><td>**Bands FDD_A**</td><td>**Bands FDD_C**</td><td>**Band FDD_D**</td><td>**Bands FDD_E, FDD_F**</td><td>**Bands FDD_G**</td><td>**Bands FDD_H**</td></tr>
<tr><td colspan="7">Normal Conditions</td></tr>
<tr><td>Lowest reported value (Cell 1)</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td>Highest reported value (Cell 1)</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td>Lowest reported value (Cell 2)</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td>Highest reported value (Cell 2)</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td><td>TBD</td></tr>
<tr><td colspan="7">Extreme Conditions</td></tr>
<tr><td>Lowest reported value (Cell 1)</td><td>RSRP_9</td><td>RSRP_10</td><td>RSRP_10</td><td>RSRP_11</td><td>RSRP_12</td><td>RSRP_12</td></tr>
<tr><td>Highest reported value (Cell 1)</td><td>RSRP_30</td><td>RSRP_31</td><td>RSRP_32</td><td>RSRP_32</td><td>RSRP_33</td><td>RSRP_34</td></tr>
<tr><td>Lowest reported value (Cell 2)</td><td>RSRP_17</td><td>RSRP_18</td><td>RSRP_18</td><td>RSRP_19</td><td>RSRP_20</td><td>RSRP_20</td></tr>
<tr><td>Highest reported value (Cell 2)</td><td>RSRP_38</td><td>RSRP_39</td><td>RSRP_40</td><td>RSRP_40</td><td>RSRP_41</td><td>RSRP_42</td></tr>
<tr><td colspan="7">Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.</td></tr>
</table>

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth

9.1.20.2.1 Test purpose

Same test purpose as in clause 9.1.6.2.1.

9.1.20.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA FDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.20.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2.3.

9.1.20.2.4 Test description

9.1.20.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.20.2.4.3.

4. Cell1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.20.2.4.2 Test procedure

Same test procedure as in clause 9.1.6.2.4.2 with the following exceptions:

- Instead of Table 9.1.6.2.5-2 → use Table 9.1.20.2.5-1.

- Instead of Table 9.1.6.2.5-3 → use Table 9.1.20.2.5-2.

9.1.20.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.20.2.4.3-1: Common Exception messages for FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz bandwidth

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.20.2.5 Test requirement

Table 9.1.20.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.20.2.5-2.

Table 9.1.20.2.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_C Note 5		-89.76		
	Bands FDD_D Note 5		-89.26		
	Bands FDD_E, FDD_F Note 5		-88.76		
	Bands FDD_G Note 5		-87.76		
	Bands FDD_H Note 5		-87.26		

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.6.2.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.

Table 9.1.20.2.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.20.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel-12 and forward)

Editor's note: This Test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Test requirements in normal conditions need to be defined*

9.1.20.2_1.1 Test purpose

Same test purpose as in clause 9.1.20.2.1.

9.1.20.2_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting CA.

9.1.20.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.6.2_1.3.

9.1.20.2_1.4 Test description

9.1.20.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.20.2.4.1.

9.1.20.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.20.2.4.2 with the following exceptions:

- Instead of Table 9.1.20.2.5-1 → use Table 9.1.20.2_1.5-1.
- Instead of Table 9.1.20.2.5-2 → use Table 9.1.20.2_1.5-2.

9.1.20.2_1.4.3 Message contents

Same message contents as in clause 9.1.20.2.4.2.

9.1.20.2_1.5 Test requirement

Table 9.1.20.2_1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.20.2_1.5-2.

Table 9.1.20.2_1.5-1: RSRP FDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz bandwidth

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5 MHz	-90.76+TT	(Io for Channel 1 +5.51dB)	
	Bands FDD_C Note 5		-89.76+TT		
	Bands FDD_D Note 5		-89.26+TT		
	Bands FDD_E, FDD_F Note 5		-88.76+TT		
	Bands FDD_G Note 5		-87.76+TT		
	Bands FDD_H Note 5		-87.26+TT		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.6.2.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.1.20.2_1.5-2: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz bandwidth

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	TBD
Highest reported value (Cell 2)	TBD
Lowest reported value (Cell 3)	TBD
Highest reported value (Cell 3)	TBD
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz

9.1.21.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz

9.1.21.1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.21.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.21.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1.2.

9.1.21.1.4 Test description

9.1.21.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.21.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.21.1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.21.1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.21.1.5-2.

9.1.21.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.21.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.21.1.5 Test requirement

Table 9.1.21.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.21.1.5-2.

Table 9.1.21.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-89.76		
	Bands TDD_E Note 5		-88.76		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.1.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.1.21.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel-12 and forward)

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-The Test tolerances applicable to this test are undefined

9.1.21.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1_1.1.

9.1.21.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and release 11 supporting CA.

9.1.21.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1_1.2

9.1.21.1_1.4 Test description

9.1.21.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.21.1.4.1 with the following exceptions:

- Instead of 9.1.21.1.4.3 → use 9.1.21.1_1.4.3.

9.1.21.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1_1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1_1.5-1 → use Table 9.1.21.1_1.5-1.
- Instead of Table 9.1.7.1_1.5-2 → use Table 9.1.21.1_1.5-2.

9.1.21.1_1.4.3 Message contents

Same message contents as in clause 9.1.19.1.4.3

9.1.21.1_1.5 Test requirement

Table 9.1.21.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.21.1_1.5-2.

Table 9.1.21.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76+TT	(Io for Channel 1 +5.33dB)	
	Bands TDD_C Note 5		-89.76+TT		
	Bands TDD_E Note 5		-88.76+TT		
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.1. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.1.21.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 5MHz + 5MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Lowest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 1)	RSRP_xx	RSRP_xx	RSRP_xx
Lowest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
Highest reported value (Cell 2)	RSRP_xx	RSRP_xx	RSRP_xx
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz

9.1.21.2.1 Test purpose

Same test purpose as in clause 9.1.7.2.1.

9.1.21.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.21.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.2.3.

9.1.21.2.4 Test description

9.1.21.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.21.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.21.2.4.2 Test procedure

Same test procedure as in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.5-1 → use Table 9.1.21.2.5-1.
- Instead of Table 9.1.7.2.5-2 → use Table 9.1.21.2.5-2.

9.1.21.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.21.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 5MHz + 5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.21.2.5 Test requirement

Table 9.1.21.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.21.2.5-2.

Table 9.1.21.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C Note 5		-89.76		
	Bands TDD_E Note 5		-88.76		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.1.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.1.21.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.21.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel-12 and forward)

Editor's note: This Test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Test requirements in normal conditions need to be defined*

9.1.21.2_1.1 Test purpose

Same test purpose as in clause 9.1.21.2.1.

9.1.21.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.21.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.21.2_1.4 Test description

9.1.21.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.21.2.4.1.

9.1.21.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.21.2.4.2 with the following exceptions:

- Instead of Table 9.1.21.2.5-1 → use Table 9.1.21.2_1.5-1.
- Instead of Table 9.1.21.2.5-2 → use Table 9.1.21.2_1.5-2.

9.1.21.2_1.4.3 Message contents

Same message contents as in clause 9.1.21.2.4.3.

9.1.21.2_1.5 Test requirement

Table 9.1.21.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.21.2_1.5-2.

Table 9.1.21.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 5MHz + 5MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.2			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD		
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm/4.5MHz	-90.76+TT	(Io for Channel 1 +5.51dB)	
	Bands TDD_C Note 5		-89.76+TT		
	Bands TDD_E Note 5		-88.76+TT		
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.1.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.1.21.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 5MHz + 5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	TBD
Highest reported value (Cell 2)	TBD
Lowest reported value (Cell 3)	TBD
Highest reported value (Cell 3)	TBD
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD

9.1.22.1 Test purpose

To verify that FDD and TDD absolute and relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD and TDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier, and the relative RSRP accuracy requirements of the secondary component carriers.This test will also verify the relative RSRP accuracy requirements of primary and secondary component carriers.

9.1.22.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell.

9.1.22.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.11.1. The TDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.22.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.22.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.22.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.22.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The FDD-TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.22.3-3 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.22.3-3: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW Channel
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.22.3-4 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.22.3-4: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.22.

9.1.22.4 Test description

9.1.22.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.22.4.3.
4. Cell 1 is PCell on the FDD primary component carrier, Cell 2 is SCell on the TDD secondary component carrier and Cell 3 is the neighbouring cell on the TDD secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.22.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.22.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10 s wait from step 6, SS shall check the reported RSRP values in periodical measurement report messages. The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.22.5-3. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.22.5-3. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.22.5-3. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 1-2”, “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all the events (“Cell 1”, “Cell 2”, “Cell 1-2”, “Cell 2-3”) pass ,the test passes. If one event fails, the test fails.

9.1.22.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.22.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.22.5 Test requirement

Table 9.1.22.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.22.5-2.

Table 9.1.22.5-1: RSRP TDD-FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note9			-	6	6
Uplink-downlink configuration Note9			-	1	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.1 and A.1.2			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 and A.2.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.2.1 (OP.1 TDD), and D.2.2 (OP.2 TDD)			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note 2 OCNG_RB Note 2		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	-	
	Bands FDD_B		-116.5	-	
	Bands FDD_C		-116	-	
	Bands FDD_D		-115.5	-	
	Bands FDD_E, FDD_F Note 6		-115	-	
	Bands FDD_G		-114	-	

	Bands FDD_H		-113.5	-	
	Bands TDD_A		-	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-		
	Bands TDD_E		-		
$\hat{E}_s/N_{oc}$		dB	-4	3	-1
$\hat{E}_s/I_{ot}$		dB	-4	0.46	-5.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	-	-
	Bands FDD_B		-120.5	-	-
	Bands FDD_C		-120	-	-
	Bands FDD_D		-119.5	-	-
	Bands FDD_E, FDD_F Note 6		-119	-	-
	Bands FDD_G		-118	-	-
	Bands FDD_H		-117.5	-	-
	Bands TDD_A		-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-		
	Bands TDD_E		-		
Io Note3	Bands FDD_A	dBm/ $BW_{channel}$	-87.76 + 10log($N_{RB,c}$/50)	-	
	Bands FDD_B		-87.26 + 10log($N_{RB,c}$/50)	-	
	Bands FDD_C		-86.76+ 10log($N_{RB,c}$/50)	-	
	Bands FDD_D		-86.26+ 10log($N_{RB,c}$/50)	-	
	Bands FDD_E, FDD_F Note 6		-85.76+ 10log($N_{RB,c}$/50)	-	
	Bands FDD_G		-84.76+ 10log($N_{RB,c}$/50)	-	
	Bands FDD_H		-84.26+ 10log($N_{RB,c}$/50)	-	
	Bands TDD_A		-	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-		
	Bands TDD_E		-		
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 8		-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.22.5-2: 2DL PCELL in FDD RSRP for EUTRA Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.								

Table 9.1.22.5-3: 2DL PCELL in FDD RSRP for EUTRA FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD

9.1.23.1 Test purpose

To verify that FDD and TDD absolute RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD and FDD absolute RSRP accuracy requirements of cells on the primary component carrier and the secondary component carrier, and the relative RSRP accuracy requirements of the secondary component carriers. This test will also verify the relative RSRP accuracy requirements of primary and secondary component carriers.

9.1.23.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD Release 12 and forward UE that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell.

9.1.23.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.11.1. The FDD RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.23.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.23.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.23.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.23.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The FDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The FDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.23.3-3 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.23.3-3: FDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW_{Channel}
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.23.3-4 for SCC relative accuracy are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.23.3-4: FDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW_{Channel}
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.4, 9.1.11.3 and A.9.1.23.

9.1.23.4 Test description

9.1.23.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.23.4.3.
4. Cell 1 is PCell on the TDD primary component carrier, Cell 2 is SCell on the FDD secondary component carrier and Cell 3 is the neighbouring cell on the FDD secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.23.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 [and C.2] for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.1.23.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10 s wait from step 6, SS shall check the reported RSRP values in periodical measurement report messages.

   The reported RSRP values for Cell 1 and Cell 2 are compared to the actual RSRP values according to Table 9.1.23.5-3. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.23.5-3. Also the reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.23.5-3. This counts respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 2-3”.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 1-2” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events (“Cell 1”, “Cell 2”, “Cell 1-2” and “Cell 2-3”) pass, the test passes. If one event fails, the test fails.

9.1.23.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.23.4.3-1: Common Exception messages for FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

9.1.23.5 Test requirement

Table 9.1.23.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.23.5-2.

Table 9.1.23.5-1: RSRP TDD-FDD absolute accuracy carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			6	-	-
Uplink-downlink configuration Note1			1	-	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.1 and A.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 and A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.2.1 (OP.1 TDD), and D.2.2 (OP.2 FDD)			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note 2					
OCNG_RB Note 2					
N_{oc} Note 3	Bands FDD_A	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-		
	Bands FDD_C		-		
	Bands FDD_D		-		
	Bands FDD_E, FDD_F Note 9		-		
	Bands FDD_G		-		

	Bands FDD_H		-		
	Bands TDD_A		-117	-	
	Bands TDD_C		-116	-	
	Bands TDD_E		-115	-	
$\hat{E}_s/N_{oc}$		dB	-4	3	-1
$\hat{E}_s/I_{ot}$		dB	-4	0.46	-5.76
RSRP Note 4	Bands FDD_A	dBm/15 kHz	-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B		-		
	Bands FDD_C		-		
	Bands FDD_D		-		
	Bands FDD_E, FDD_F Note 9		-		
	Bands FDD_G		-		
	Bands FDD_H		-		
	Bands TDD_A		-121	-	-
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io Note 4	Bands FDD_A	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.33dB+10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_B		-		
	Bands FDD_C		-		
	Bands FDD_D		-		
	Bands FDD_E, FDD_F Note 9		-		
	Bands FDD_G		-		
	Bands FDD_H		-		
	Bands TDD_A		-87.76 + 10log($N_{RB,c}$/50)	-	
	Bands TDD_C		-86.76 + 10log($N_{RB,c}$/50)	-	
	Bands TDD_E		-85.76 + 10log($N_{RB,c}$/50)	-	
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2
Timing offset to cell 1		μs	-	0	3
Time alignment error relative to cell 1 Note 8		-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 8: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.23.5-2: 2DL PCELL in TDD RSRP for EUTRAN FDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.				

Table 9.1.23.5-3: 2DL PCELL in TDD RSRP for EUTRAN FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz

9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz

9.1.24.1.1 Test purpose

Same test purpose as in clause 9.1.7.1.1.

9.1.24.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.24.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1.3

9.1.24.1.4 Test description

9.1.24.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.1.24.1.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.24.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.24.1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1.5-1 → use Table 9.1.24.1.5-1.
- Instead of Table 9.1.7.1.5-2 → use Table 9.1.24.1.5-2.

9.1.24.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.24.1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 20MHz + 10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.24.1.5 Test requirement

Table 9.1.24.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.24.1.5-2.

Table 9.1.24.1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R3.TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	
			10MHz+20MHz	R.6 TDD	R.10 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	dBm/$BW_{channel}$	All	-87.76 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-86.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-85.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/ $BW_{channel}$	All	N/A	(Io for Channel 1 +5.33dB) +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.1.5-1 for the other parameters.
Note 4: For each parameter, the allowed combinations are shown in separate rows.

Table 9.1.24.1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 20MHz + 10MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)	RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)	RSRP_35	RSRP_36	RSRP_37
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40

NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)

9.1.24.1_1.1 Test purpose

Same test purpose as in clause 9.1.7.1_1.1.

9.1.24.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.24.1_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.1_1.3

9.1.24.1_1.4 Test description

9.1.24.1_1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz for Cell 1 on the PCC, 10MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.24.1_1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.24.1_1.4.2 Test procedure

Same test procedure as in clause 9.1.7.1_1.4.2 with the following exceptions:

- Instead of Table 9.1.7.1_1.5-1 → use Table 9.1.24.1_1.5-1.
- Instead of Table 9.1.7.1_1.5-2 → use Table 9.1.24.1_1.5-2.

9.1.24.1_1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.24.1_1.4.3-1: Common Exception messages for TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 20MHz + 10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.24.1_1.5 Test requirement

Table 9.1.24.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.24.1_1.5-2.

Table 9.1.24.1_1.5-1: RSRP TDD absolute accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20	10	
Measurement bandwidth		n_{PRB}	47-52	22-27	
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.0 TDD	N/A
PDSCH allocation		n_{PRB}	38-61	13-36	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD	R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD), D.2.2 (OP.2 TDD) and D.2.7 (OP.7 TDD)			OP.7 TDD	OP.1 TDD	OP.2 TDD
Io Note2	Bands TDD_A	dBm/18 MHz	-84.76	N/A	
	Bands TDD_C		-83.76		
	Bands TDD_E		-82.76		
	Bands TDD_A	dBm/9MHz	N/A	(Io for Channel 1 +2.33dB)	
	Bands TDD_C				
	Bands TDD_E				
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.1.7.1_1.5-1 for the other parameters.					

Table 9.1.24.1_1.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values for 20MHz + 10MHz

Parameter	Test 1		
Band of Cell 1 on Primary Component Carrier	**Bands TDD_A**	**Bands TDD_C**	**Band TDD_E**
Normal Conditions			
Lowest reported value (Cell 1)	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)	RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)	RSRP_34	RSRP_35	RSRP_36
Extreme Conditions			
Lowest reported value (Cell 1)	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)	RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)	RSRP_38	RSRP_39	RSRP_40
NOTE: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz

9.1.24.2.1 Test purpose

Same test purpose as in clause 9.1.7.2.1.

9.1.24.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11 supporting CA with Intra-band contiguous CA, or Inter-band CA.

This test applies to all types of E-UTRA TDD UE release 11 supporting CA with Intra-band non-contiguous CA.

9.1.24.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.7.2.3.

9.1.24.2.4 Test description

9.1.24.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.1.24.2.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.24.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.24.2.4.2 Test procedure

Same test procedure as in clause 9.1.7.2.4.2 with the following exceptions:

- Instead of Table 9.1.7.2.5-1 → use Table 9.1.24.2.5-1.
- Instead of Table 9.1.7.2.5-2 → use Table 9.1.24.2.5-2.

9.1.24.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.24.2.4.3-1: Common Exception messages for TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation test requirement for 20MHz + 10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-3 Table H.4.1-5

9.1.24.2.5 Test requirement

Table 9.1.24.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.24.2.5-2.

Table 9.1.24.2.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R3.TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	
			10MHz+20MHz	R.6 TDD	R.10 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	$dBm/BW_{channel}$	All	-87.76 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-86.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-85.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	$dBm/ BW_{channel}$	All	N/A	(Io for Channel 1 +5.33dB) +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.1.7.2.5-1 for the other parameters. Note 4: For each parameter, the allowed combinations are shown in separate rows.						

Table 9.1.24.2.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 20MHz + 10MHz

	Test 1
	All bands
Normal and Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)

9.1.24.2_1.1 Test purpose

Same test purpose as in clause 9.1.24.2.1.

9.1.24.2_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting CA.

9.1.24.2_1.3 Minimum conformance requirements

Same minimum conformance requirements as defined in clause 9.1.7.2_1.3.

9.1.24.2_1.4 Test description

9.1.24.2_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.24.2.4.1.

9.1.24.2_1.4.2 Test procedure

Same test procedure as in clause 9.1.24.2.4.2 with the following exceptions:

- Instead of Table 9.1.24.2.5-1 → use Table 9.1.24.2_1.5-1.
- Instead of Table 9.1.24.2.5-2 → use Table 9.1.24.2_1.5-2.

9.1.24.2_1.4.3 Message contents

Same message contents as in clause 9.1.24.2.4.2

9.1.24.2_1.5 Test requirement

Table 9.1.24.2_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.24.2_1.5-2.

Table 9.1.24.2_1.5-1: RSRP TDD relative accuracy carrier aggregation test parameters for 20MHz + 10MHz

Parameter		Unit	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel}$ Note 1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R3.TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	
			10MHz+20MHz	R.6 TDD	R.10 TDD	
OCNG Patterns defined in A.3.2.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	dBm/$BW_{channel}$	All	-87.76 + 10log($N_{RB,c}$/50)	N/A	
	Bands TDD_C			-86.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_E			-85.76 + 10log($N_{RB,c}$/50)		
	Bands TDD_A	dBm/ $BW_{channel}$	All	N/A	(Io for Channel 1 +5.33dB) +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					

Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.1.7.2.5-1 for the other parameters.
Note 4: For each parameter, the allowed combinations are shown in separate rows.

Table 9.1.24.2_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values for 20MHz + 10MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRP_x + 2
Highest reported value (Cell 2)	RSRP_x + 15
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
Extreme Conditions	
Lowest reported value (Cell 2)	RSRP_x – 1
Highest reported value (Cell 2)	RSRP_x + 17
Lowest reported value (Cell 3)	RSRP_y – 8
Highest reported value (Cell 3)	RSRP_y + 1
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.25.1 Test purpose

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits.

9.1.25.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.25.3 Minimum conformance requirements

Intra-frequency absolute RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.2.1.Intra-frequency relative RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.2.2.

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.25.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.1.25.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.25.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.25.3-2: RSRP Intra frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.25.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.25.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.25.

9.1.25.4 Test description

9.1.25.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.25.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.25.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.25.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.25.5-2. This counts as a Pass or Fail for the events "Cell 2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.25.5-3. This counts as a Pass or Fail for the events "Cell 1-2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1" and "Cell 1-2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.25.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.25.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.25.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.25.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.25.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.1.25.5 Test requirement

Table 9.1.25.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.25.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.25.5-3.

Table 9.1.25.5-1: RSRP FDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Measurement bandwidth		n_{PRB}	22—27	
DTMC period		ms	N/A	160
DTMC period offset			N/A	10
Discovery signal occasion duration		ms	N/A	1
Time offset between cells		µs	2.3	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107	-107
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101.0	-105.0
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05	-71.05
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
$\hat{E}_s/N_{oc}$		dB	6.0	2.0
Propagation condition		-	AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

Table 9.1.25.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_29
Highest reported value (Cell 2)		RSRP_42
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_25
Highest reported value (Cell 2)		RSRP_46

Table 9.1.25.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.26.1 Test purpose

Same test purpose as in clause 9.1.25.1.

9.1.26.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.26.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.25.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.26.

9.1.26.4 Test description

9.1.26.4.1 Initial conditions

Same initial conditions as in clause 9.1.25.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.26.4.3.

9.1.26.4.2 Test procedure

Same test procedure as in clause 9.1.25.4.2 with the following exceptions:

- Instead of Table 9.1.25.5-1 → use Table 9.1.26.5-1.
- Instead of Table 9.1.25.5-2 → use Table 9.1.26.5-2.
- Instead of Table 9.1.25.5-3 → use Table 9.1.26.5-3.

9.1.26.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.26.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.26.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.26.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.26.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.26.5 Test requirement

Table 9.1.26.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.26.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.26.5-3.

Table 9.1.26.5-1: RSRP TDD Intra frequency test parameters

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Test 1</th></tr>
<tr><th>Cell 1</th><th>Cell 2</th></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td>MHz</td><td colspan="2">10</td></tr>
<tr><td colspan="2">Special subframe configuration[Note1]</td><td></td><td colspan="2">6</td></tr>
<tr><td colspan="2">Uplink/downlink configuration[Note1]</td><td></td><td colspan="2">1</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td colspan="2">22—27</td></tr>
<tr><td colspan="2">DTMC period</td><td>ms</td><td>N/A</td><td>160</td></tr>
<tr><td colspan="2">DTMC period offset</td><td></td><td>N/A</td><td>10</td></tr>
<tr><td colspan="2">Discovery signal occasion duration</td><td>ms</td><td>N/A</td><td>2</td></tr>
<tr><td colspan="2">Time offset between cells</td><td>μs</td><td colspan="2">2.3</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.2</td><td></td><td>R.0 TDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13—36</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td colspan="2">R.6 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)</td><td></td><td>OP.1 TDD</td><td>OP.2 TDD</td></tr>
<tr><td colspan="2">PBCH_RA</td><td rowspan="13">dB</td><td rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td colspan="2">PBCH_RB</td></tr>
<tr><td colspan="2">PSS_RA</td></tr>
<tr><td colspan="2">SSS_RA</td></tr>
<tr><td colspan="2">PCFICH_RB</td></tr>
<tr><td colspan="2">PHICH_RA</td></tr>
<tr><td colspan="2">PHICH_RB</td></tr>
<tr><td colspan="2">PDCCH_RA</td></tr>
<tr><td colspan="2">PDCCH_RB</td></tr>
<tr><td colspan="2">PDSCH_RA</td></tr>
<tr><td colspan="2">PDSCH_RB</td></tr>
<tr><td colspan="2">OCNG_RA[Note2]</td></tr>
<tr><td colspan="2">OCNG_RB[Note2]</td></tr>
<tr><td rowspan="3">N_{oc} [Note3]</td><td>Bands TDD_A</td><td rowspan="3">dBm/15 kHz</td><td rowspan="3">-107</td><td rowspan="3">-107</td></tr>
<tr><td>Bands TDD_C</td></tr>
<tr><td>Bands TDD_E</td></tr>
<tr><td colspan="2">$\hat{E}_s/I_{ot}$</td><td>dB</td><td>1.88</td><td>-4.97</td></tr>
<tr><td rowspan="3">RSRP[Note4]</td><td>Bands TDD_A</td><td rowspan="3">dBm/15 kHz</td><td rowspan="3">-101.0</td><td rowspan="3">-105.0</td></tr>
<tr><td>Bands TDD_C</td></tr>
<tr><td>Bands TDD_E</td></tr>
<tr><td rowspan="3">Io[Note4]</td><td>Bands TDD_A</td><td rowspan="3">dBm/9 MHz</td><td rowspan="3">-71.05</td><td rowspan="3">-71.05</td></tr>
<tr><td>Bands TDD_C</td></tr>
<tr><td>Bands TDD_E</td></tr>
<tr><td colspan="2">$\hat{E}_s/N_{oc}$</td><td>dB</td><td>6.0</td><td>2.0</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td colspan="2">AWGN</td></tr>
</table>

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.26.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_29
Highest reported value (Cell 2)		RSRP_42
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRP_25
Highest reported value (Cell 2)		RSRP_46

Table 9.1.26.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.27.1 Test purpose

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits.

9.1.27.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.1.27.3 Minimum conformance requirements

Inter-frequency absolute RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.3.1. Inter-frequency relative RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.3.2.

The requirements for absolute accuracy of RSRP apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.27.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.3 for a corresponding Band

Table 9.1.27.3-1: RSRP Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.27.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.27.3-2: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.27.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.27.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.27.

9.1.27.4 Test description

9.1.27.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.27.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.27.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.27.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.27.5-2. This counts as a Pass or Fail for the events “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.27.5-3. This counts as a Pass or Fail for the events “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved..

Each of the events “Cell 1” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.27.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.27.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.27.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.27.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.27.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.1.27.5 Test requirement

Table 9.1.27.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.27.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.27.5-3.

Table 9.1.27.5-1: CRS RSRP FDD-FDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	1
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands FDD_B			-114.5
	Bands FDD_C			-114
	Bands FDD_D			-113.5
	Bands FDD_E, FDD_F Note 5			-113
	Bands FDD_G Note 7			-112
	Bands FDD_H			-111.5
$\hat{E}_s/I_{ot}$		dB	13	-5.2
RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 2 +24.2dB)	-120.2
	Bands FDD_B			-119.7
	Bands FDD_C			-119.2
	Bands FDD_D			-118.7
	Bands FDD_E, FDD_F Note 5			-118.2
	Bands FDD_G Note 7			-117.2
	Bands FDD_H			-116.7
Io Note3	Bands FDD_A	dBm/9 MHz	(Io for Channel 2 +18.07dB)	-86.07
	Bands FDD_B			-85.57
	Bands FDD_C			-85.07
	Bands FDD_D			-84.57
	Bands FDD_E, FDD_F Note 5			-84.04
	Bands FDD_G Note 7			-83.07
	Bands FDD_H			-82.57

$\hat{E}_s/N_{oc}$	dB	13	-5.2
Propagation condition	-	AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: Except Band 29 and Band 32. Note 8: DMTC is provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test			

Table 9.1.27.5-2: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Event	Test 1	
Lowest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_14
		Bands FDD_B	RSRP_15
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_16
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_18
Highest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_26
		Bands FDD_B	RSRP_27
		Bands FDD_C	RSRP_27
		Bands FDD_D	RSRP_28
		Bands FDD_E, FDD_F	RSRP_28
		Bands FDD_G	RSRP_29
		Bands FDD_H	RSRP_30
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_10
		Bands FDD_B	RSRP_10
		Bands FDD_C	RSRP_11
		Bands FDD_D	RSRP_11
		Bands FDD_E, FDD_F	RSRP_12
		Bands FDD_G	RSRP_13
		Bands FDD_H	RSRP_13
Highest reported value (Cell 2)	Cell 2	Bands FDD_A	RSRP_31
		Bands FDD_B	RSRP_31
		Bands FDD_C	RSRP_32
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_33
		Bands FDD_G	RSRP_34
		Bands FDD_H	RSRP_34

Table 9.1.27.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 31
Highest reported value (Cell 2)		RSRP_Cell 1 - 18
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 33
Highest reported value (Cell 2)		RSRP_Cell 1 - 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal

9.1.28.1 Test purpose

Same test purpose as in clause 9.1.27.1.

9.1.28.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.1.28.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.27.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.4 and A.9.1.28.

9.1.28.4 Test description

9.1.28.4.1 Initial conditions

Same initial conditions as in clause 9.1.27.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.28.4.3.

9.1.28.4.2 Test procedure

Same test procedure as in clause 9.1.25.4.2 with the following exceptions:

- Instead of Table 9.1.27.5-1 → use Table 9.1.28.5-1.
- Instead of Table 9.1.27.5-2 → use Table 9.1.28.5-2.
- Instead of Table 9.1.27.5-3 → use Table 9.1.28.5-3.

9.1.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.28.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.28.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.28.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.1.28.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.28.5 Test requirement

Table 9.1.28.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.28.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.28.5-3.

Table 9.1.28.5-1: CRS RSRP TDD—TDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	2
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note2]				
OCNG_RB[Note2]				
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands TDD_C			-114
	Bands TDD_E			-113
$\hat{E}_s/I_{ot}$		dB	13	-5.2
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 2 +24.2dB)	-120.2
	Bands TDD_C			-119.2
	Bands TDD_E			-118.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	(Io for Channel 2 +18.07B)	-86.07
	Bands TDD_C			-85.07
	Bands TDD_E			-84.07
$\hat{E}_s/N_{oc}$		dB	13	-5.2
Propagation condition		-	AWGN	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211[9]. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.				

Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	DMTC is provided to the UE in the measDS-Config (in TS36.331 [5]) before the beginning of test

Table 9.1.28.5-2: RSRP TDD Inter frequency absolute accuracy requirements for the reported values

Normal Conditions	Event	Test 1	
Lowest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_14
		Bands TDD_C	RSRP_15
		Bands TDD_E	RSRP_16
Highest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_26
		Bands TDD_C	RSRP_27
		Bands TDD_E	RSRP_28
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_10
		Bands TDD_C	RSRP_11
		Bands TDD_E	RSRP_12
Highest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_31
		Bands TDD_C	RSRP_32
		Bands TDD_E	RSRP_33

Table 9.1.28.5-3: RSRP TDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 31
Highest reported value (Cell 2)		RSRP_Cell 1 - 18
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 33
Highest reported value (Cell 2)		RSRP_Cell 1 - 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.29.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.29.2 Test applicability

This test applies to all types to E-UTRA FDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.29.3 Minimum conformance requirements

Intra-frequency absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.14.3.1.1. Intra-frequency relative CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.14.3.1.2.

The absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.29.3-1 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.14.2 for a corresponding Band.

Table 9.1.29.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥ 0 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥ 0 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.29.3-2 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.15.2 for a corresponding Band.

Table 9.1.29.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥ 0 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: Void
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.29.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.29.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.29.

9.1.29.4 Test description

9.1.29.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 as appropriate.

2. Propagation conditions are set according to Annex B.0.

3. Message contents are defined in clause 9.1.29.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.29.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.29.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

   The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.29.5-2. This counts as a Pass or Fail for the event "Cell 2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 2 is compared to the reported CSI-RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.29.5-3. This counts as a Pass or Fail for the event "Cell 1-2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 2" and "Cell 1-2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.29.4.3-1: Common Exception message for CSI-RSRP FDD intra frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-1 Table H.3.8-4 Table H.3.8-5

Table 9.1.29.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP FDD intra frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.29.4.3-3: *MeasResults*: Additional CSI-RSRP FDD intra frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 2	
csi-RSRP-Result-r12	INTEGER(0.97)	Set according to specific test	
}			
}			
}			

9.1.29.5 Test requirement

Table 9.1.29.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.29.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.29.5-3.

Table 9.1.29.5-1: CSI-RSRP FDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
DMTC period		ms	160	
DMTC period offset		ms	10	
Discovery signal occasion duration		ms	1	
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	2.3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
p-C-r10[2]		dB	6	6
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-116	
	Bands FDD_B		-115.5	
	Bands FDD_C		-115	
	Bands FDD_D		-114.5	
	Bands FDD_E, FDD_F Note 5		-114	
	Bands FDD_G Note 7		-113	
	Bands FDD_H		-112.5	
CRS $\hat{E}_s/I_{ot}$		dB	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	6.46	1.04
RSRP Note3	Bands FDD_A	dBm/15 kHz	-113	-117
	Bands FDD_B		-112.5	-116.5
	Bands FDD_C		-112	-116
	Bands FDD_D		-111.5	-115.5
	Bands FDD_E, FDD_F Note 5		-111	-115
	Bands FDD_G Note 7		-110	-114
	Bands FDD_H		-109.5	-113.5
CSI-RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 1 +6dB)	(RSRP for Cell 2 +6.8dB)
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			

	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	-82.43	
	Bands FDD_B		-81.93	
	Bands FDD_C		-81.43	
	Bands FDD_D		-80.93	
	Bands FDD_E, FDD_F Note 5		-80.43	
	Bands FDD_G Note 7		-79.43	
	Bands FDD_H		-78.93	
CRS $\hat{E}_s/N_{oc}$		dB	3	-1
CSI-RS $\hat{E}_s/N_{oc}$		dB	9	5.8
Propagation condition		-	AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: Except Band 29 and Band 32. Note 8: DMTC is provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test				

Table 9.1.29.5-2: CSI-RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_25	CSI_RSRP_26	CSI_RSRP_26	CSI_RSRP_27	CSI_RSRP_28
Highest reported value (Cell 2)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40
Extreme Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23	CSI_RSRP_23
Highest reported value (Cell 2)		CSI_RSRP_41	CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_42	CSI_RSRP_43	CSI_RSRP_44	CSI_RSRP_45

Table 9.1.29.5-3: CSI-RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 7
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.30.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.30.2 Test applicability

This test applies to all types to E-UTRA TDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.1.30.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.29.3

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.30.

9.1.30.4 Test description

9.1.30.4.1 Initial conditions

Same initial conditions as in clause 9.1.29.4.1 with the following exception:

- Message contents are defined in clause 9.1.30.4.3.

9.1.30.4.2 Test procedure

Same test procedure as in clause 9.1.29.4.2 with the following exceptions:

- Instead of Table 9.1.29.5-1 → use Table 9.1.30.5-1.
- Instead of Table 9.1.29.5-2 → use Table 9.1.30.5-2.
- Instead of Table 9.1.29.5-3 → use Table 9.1.30.5-3.

9.1.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.30.4.3-1: Common Exception message for CSI-RSRP TDD intra frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-1 Table H.3.8-4 Table H.3.8-5

Table 9.1.30.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP TDD intra frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.30.4.3-3: *MeasResults*: Additional CSI-RSRP TDD intra frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 2	
csi-RSRP-Result-r12	INTEGER(0.97)	Set according to specific test	
}			
}			
}			

9.1.30.5 Test requirement

Table 9.1.30.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.30.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.30.5-3.

Table 9.1.30.5-1: CSI-RSRP TDD Intra frequency test parameters

Parameter		Unit	Test 1 Cell 1	Test 1 Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
DMTC period		ms	160	
DMTC period offset		ms	10	
Discovery signal occasion duration		ms	2	
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	2.3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
p-C-r10[2]		dB	6	6
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-116	
	Bands TDD_C		-115	
	Bands TDD_E		-114	
CRS $\hat{E}_s/I_{ot}$		dB	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	6.46	1.04
RSRP[Note3]	Bands TDD_A	dBm/15 kHz	-113	-117
	Bands TDD_C		-112	-116
	Bands TDD_E		-111	-115
CSI-RSRP [Note3]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 1 +6dB)	(RSRP for Cell 2 +6.8dB)
	Bands TDD_C			
	Bands TDD_E			
Io[Note3]	Bands TDD_A	dBm/9 MHz	-82.43	
	Bands TDD_C		-81.43	
	Bands TDD_E		-80.43	
CRS $\hat{E}_s/N_{oc}$		dB	3	-1
CSI-RS $\hat{E}_s/N_{oc}$		dB	9	5.8
Propagation condition		-	AWGN	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.				
Note 2: OCNG shall be used such that both cells are fully allocated and a				

	constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	DMTC is provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test.

Table 9.1.30.5-2: CSI-RSRP TDD Intra frequency absolute accuracy requirements for the reported values

	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_38
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22
Highest reported value (Cell 2)		CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_43

Table 9.1.30.5-3: CSI-RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 7
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.31.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.31.2 Test applicability

This test applies to all types to E-UTRA FDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bits 16 and 25.

9.1.31.3 Minimum conformance requirements

Inter-frequency absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.14.3.2.1. Inter-frequency relative CSI-RSRP measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.14.3.2.2.

The absolute CSI-RSRP measurement accuracy requirements for discovery signal measurements apply to a cell or TP on a different carrier frequency from that of the serving cell.

The accuracy requirements in Table 9.1.31.3-1 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.16.2 for a corresponding band.

Table 9.1.31.3-1: Inter-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥0 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥0 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on a different frequency from another cell or from another TP.

The accuracy requirements in Table 9.1.31.3-2 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.17.2 for a corresponding band.

$$\left| CSI\_RSRP1|_{dBm} - CSI\_RSRP2|_{dBm} \right| \le 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.31.3-2: Inter-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	CSI Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥0 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.31.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.31.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.31.

9.1.31.4 Test description

9.1.31.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 as appropriate.
2. Propagation conditions are set according to Annex B.0.
3. Message contents are defined in clause 9.1.31.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.31.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.31.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

   The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.31.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

   The reported CSI-RSRP value of Cell 2 is compared to the reported CSI-RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.31.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.31.4.3-1: Common Exception message for CSI-RSRP FDD-FDD inter frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-2 Table H.3.8-4 Table H.3.8-5 Table H.3.8-6

Table 9.1.31.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP FDD-FDD inter frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		Cell 1
	10		Cell 2
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	Cell 1
	PhysCellId of Cell 2	INTEGER(0..503)	Cell 2
scramblingIdentity-r12	0		
resourceConfig-r12	2		Cell 1
	4		Cell 2
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.31.4.3-3: *MeasResults*: Additional CSI-RSRP FDD-FDD inter frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		Cell 1
	2		Cell 2
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.31.5 Test requirement

Table 9.1.31.5-1 defines the primary level settings including test tolerances for all tests.

The CS-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.31.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.31.5-3.

Table 9.1.31.5-1: CSI-RSRP FDD-FDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	160	160
DMTC period offset		ms	0	10
Discovery signal occasion duration		ms	1	1
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
p-C-r10[2]		dB	0	6
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands FDD_B			-114.5
	Bands FDD_C			-114
	Bands FDD_D			-113.5
	Bands FDD_E, FDD_F Note 5			-113
	Bands FDD_G Note 7			-112
	Bands FDD_H			-111.5
CRS $\hat{E}_s/I_{ot}$		dB	13	-6
CSI-RS $\hat{E}_s/I_{ot}$		dB	13	0.8
RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 2 +25dB)	-121
	Bands FDD_B			-120.5
	Bands FDD_C			-120
	Bands FDD_D			-119.5
	Bands FDD_E, FDD_F Note 5			-119
	Bands FDD_G Note 7			-118
	Bands FDD_H			-117.5

CSI-RSRP Note3	Bands FDD_A	dBm/15 kHz	(RSRP for Cell 1 +0dB)	(RSRP for Cell 2 +6.8dB)
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	(Io for Channel 2 +19.68dB)	-86.25
	Bands FDD_B			-85.75
	Bands FDD_C			-85.25
	Bands FDD_D			-84.75
	Bands FDD_E, FDD_F Note 5			-84.25
	Bands FDD_G Note 7			-83.25
	Bands FDD_H			-82.75
CRS $\hat{E}_s/N_{oc}$		dB	13	-6
CSI-RS $\hat{E}_s/N_{oc}$		dB	13	0.8
Propagation condition		-	AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.
Note 7: Except Band 29 and Band 32.
Note 8: DMTC is provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test.

Table 9.1.31.5-2: CSI-RSRP FDD-FDD Inter frequency absolute accuracy requirements for the reported values

	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_29	CSI_RSRP_30	CSI_RSRP_31	CSI_RSRP_32	CSI_RSRP_33
Extreme Conditions								
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_16	CSI_RSRP_16	CSI_RSRP_17	CSI_RSRP_17	CSI_RSRP_18	CSI_RSRP_19	CSI_RSRP_19
Highest reported value (Cell 2)		CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40	CSI_RSRP_40

Table 9.1.31.5-3: CSI-RSRP FDD-FDD Inter frequency relative accuracy requirements for the reported values

	Event	All bands
Normal and Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 25
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 27
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 11

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.32 TDD-TDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal

9.1.32.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies in CSI-RS based discovery signal are within the specified limits.

9.1.32.2 Test applicability

This test applies to all types to E-UTRA TDD UE release 12 and forward that supports CSI-RS based discovery signals measurement. Applicability requires support for FGI bits 16 and 25.

9.1.32.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.31.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3 and A.9.1.32.

9.1.32.4 Test description

9.1.32.4.1 Initial conditions

Same initial conditions as in clause 9.1.31.4.1 with the following exception:

- Message contents are defined in clause 9.1.32.4.3.

9.1.32.4.2 Test procedure

Same test procedure as in clause 9.1.31.4.2 with the following exceptions:

- Instead of Table 9.1.31.5-1 → use Table 9.1.32.5-1.
- Instead of Table 9.1.31.5-2 → use Table 9.1.32.5-2.
- Instead of Table 9.1.31.5-3 → use Table 9.1.32.5-3.

9.1.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.32.4.3-1: Common Exception message for CSI-RSRP TDD-TDD inter frequency accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-2 Table H.3.8-4 Table H.3.8-5 Table H.3.8-6

Table 9.1.32.4.3-2: *MeasDS-Config-DEFAULT*: Additional CSI-RSRP TDD-TDD inter frequency accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		Cell 1
	10		Cell 2
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	Cell 1
	PhysCellId of Cell 2	INTEGER(0..503)	Cell 2
scramblingIdentity-r12	0		
resourceConfig-r12	2		Cell 1
	4		Cell 2
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.32.4.3-3: *MeasResults*: Additional CSI-RSRP TDD-TDD inter frequency accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		Cell 1
	2		Cell 2
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.32.5 Test requirement

Table 9.1.32.5-1 defines the primary level settings including test tolerances for all tests.

The CS-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.32.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.32.5-3.

Table 9.1.32.5-1: CSI-RSRP TDD-TDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	**Cell 2**
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
Gap Pattern Id			0	-
gapOffset		ms	9	
DMTC period		ms	160	160
DMTC period offset		ms	0	10
Discovery signal occasion duration		ms	2	2
CSI-RS resource configuration			2	4
CSI-RS periodicity		ms	10	
CSI-RS subframe offset		ms	0	
CSI-RS individual offset[2]		dB	0	0
CSI-RS muting			Enable	Enable
Time offset between cells		µs	-	3
Measurement bandwidth		n_{PRB}	22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note2]				
OCNG_RB[Note2]				
p-C-r10[2]		dB	0	6
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	(N_{oc} for Channel 2 +6dB)	-115
	Bands TDD_C			-114
	Bands TDD_E			-113
CRS $\hat{E}_s/I_{ot}$		dB	13	-6
CSI-RS $\hat{E}_s/I_{ot}$		dB	13	0.8
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 2 +25dB)	-121
	Bands TDD_C			-120
	Bands TDD_E			-119
CSI-RSRP Note3	Bands TDD_A	dBm/15 kHz	(RSRP for Cell 1 +0dB)	(RSRP for Cell 2 +6.8dB)
	Bands TDD_C			
	Bands TDD_E			
Io[Note4]	Bands TDD_A	dBm/9 MHz	(Io for Channel 2 +18.24dB)	-86.25
	Bands TDD_C			-85.25
	Bands TDD_E			-84.25

CRS $\hat{E}_s/N_{oc}$	dB	13	-6
CSI-RS $\hat{E}_s/N_{oc}$	dB	13	0.8
Propagation condition	-	AWGN	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe. Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: DMTC is provided to the UE in the measDS-Config (in TS36.331) before the beginning of test.			

Table 9.1.32.5-2: CSI-RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_22
Highest reported value (Cell 2)		CSI_RSRP_[32	CSI_RSRP_33	CSI_RSRP_34
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_16	CSI_RSRP_17	CSI_RSRP_18
Highest reported value (Cell 2)		CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_39

Table 9.1.32.5-3: CSI-RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 25
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 27
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 11

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.1.33.1 Test purpose

The purpose of this test is to verify that the RSRP absolute and relative measurement accuracies in carrier aggregation in CRS based discovery signal are within the specified limits.

9.1.33.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.1.33.3 Minimum conformance requirements

RSRP measurement of cells on the primary component carrier or any of the secondary component carrier(s) in discovery signal occasions shall meet the intra frequency absolute accuracy requirements in TS36.133 [4] section 9.1.2.1.

The accuracy requirements in Table 9.1.33.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.1.33.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in TS36.133 [4] sections 9.1.2.2.

The accuracy requirements in Table 9.1.33.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.33.3-2: RSRP Intra frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in TS36.133 [4] sections 9.1.3.2.

The accuracy requirements in Table 9.1.33.3-3 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.33.3-3: RSRP Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.33.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.33.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.2, clause 9.1.4 and A.9.1.33.

9.1.33.4 Test description

9.1.33.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.33.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.33.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.33.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 3 reported by the UE is compared to actual RSRP value according to Table

9.1.33.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
The reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell2 and Cell1 for each MeasurementReport message according to Table 9.1.33.5-3. This counts as a Pass or Fail for the events “Cell 2-3” and “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 3”, “Cell 2-3” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.33.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

Table 9.1.33.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.1.33.5 Test requirement

Table 9.1.33.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.33.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.33.5-3.

Table 9.1.33.5-1: RSRP FDD carrier aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
DMTC period		ms	N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration		ms	N/A	N/A	1
Timing offset to cell1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/I_{ot}$		dB	-4	0.09	-4.96
RSRPNote3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_C		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
IoNote3	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands FDD_C		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F Note 6		-85.76		

	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.33.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Event	Test 1	
Lowest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_18
		Bands FDD_B	RSRP_19
		Bands FDD_C	RSRP_19
		Bands FDD_D	RSRP_20
		Bands FDD_E, FDD_F	RSRP_20
		Bands FDD_G	RSRP_21
		Bands FDD_H	RSRP_22
Highest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_30
		Bands FDD_B	RSRP_31
		Bands FDD_C	RSRP_31
		Bands FDD_D	RSRP_32
		Bands FDD_E, FDD_F	RSRP_32
		Bands FDD_G	RSRP_33
		Bands FDD_H	RSRP_34
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_14
		Bands FDD_B	RSRP_14
		Bands FDD_C	RSRP_15
		Bands FDD_D	RSRP_15
		Bands FDD_E, FDD_F	RSRP_16
		Bands FDD_G	RSRP_17
		Bands FDD_H	RSRP_17
Highest reported value (Cell 3)	Cell 3	Bands FDD_A	RSRP_35
		Bands FDD_B	RSRP_35
		Bands FDD_C	RSRP_36
		Bands FDD_D	RSRP_36
		Bands FDD_E, FDD_F	RSRP_37
		Bands FDD_G	RSRP_38
		Bands FDD_H	RSRP_38

Table 9.1.33.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 2
Highest reported value (Cell 3)		RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 4
Highest reported value (Cell 3)		RSRP_Cell 1 + 13

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.1.34.1 Test purpose

Same test purpose as in clause 9.1.33.1.

9.1.34.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.1.34.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.33.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.2, clause 9.1.4 and A.9.1.34.

9.1.34.4 Test description

9.1.34.4.1 Initial conditions

Same initial conditions as in clause 9.1.33.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.34.4.3.

9.1.34.4.2 Test procedure

Same test procedure as in clause 9.1.33.4.2 with the following exceptions:

- Instead of Table 9.1.33.5-1 → use Table 9.1.34.5-1.
- Instead of Table 9.1.33.5-2 → use Table 9.1.34.5-2.
- Instead of Table 9.1.33.5-3 → use Table 9.1.34.5-3.

9.1.34.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.34.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

Table 9.1.34.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.1.34.5 Test requirement

Table 9.1.34.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.34.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.34.5-3.

Table 9.1.34.5-1: Carrier aggregation RSRP test parameters for TDD

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell 3

E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
DMTC period		ms	N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration		ms	N/A	N/A	2
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1	-
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
$\hat{E}_s/I_{ot}$		dB	-4	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.51dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		

$\hat{E}_s/N_{oc}$	dB	-4	3	-0.2
Propagation condition	-	AWGN		
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 8: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.34.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Event	Test 1	
Lowest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_18
		Bands TDD_C	RSRP_19
		Bands TDD_E	RSRP_20
Highest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_30
		Bands TDD_C	RSRP_31
		Bands TDD_E	RSRP_32
Extreme Conditions	**Event**	**Test 1**	
Lowest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_14
		Bands TDD_C	RSRP_15
		Bands TDD_E	RSRP_16
Highest reported value (Cell 3)	Cell 3	Bands TDD_A	RSRP_35
		Bands TDD_C	RSRP_36
		Bands TDD_E	RSRP_37

Table 9.1.34.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 2
Highest reported value (Cell 3)		RSRP_Cell 1 + 12
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 3)	Cell 1-3	RSRP_Cell 1 - 4
Highest reported value (Cell 3)		RSRP_Cell 1 + 13

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal

9.1.35.1 Test purpose

The purpose of this test is to verify that the CSI-RSRP absolute and relative measurement accuracies for carrier aggregation in CSI-RS based discovery signal are within the specified limits. This test will verify the absolute CSI-RSRP accuracy requirements of the primary component carrier, the absolute CSI-RSRP accuracy requirements of the secondary component carrier, and the relative CSI-RSRP accuracy requirements of the secondary component carrier. The test will also verify the primary and secondary component carrier relative CSI-RSRP accuracy requirement.

9.1.35.2 Test applicability

This test applies to all types to E-UTRA FDD UE release 12 and forward that supports CA and CSI-RS based discovery signals measurement.

9.1.35.3 Minimum conformance requirements

The CSI-RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.1. The CSI-RSRP measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.2.

The absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.35.3-1 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.14.2 for a corresponding Band.

Table 9.1.35.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥ 0 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥ 0 dB	FDD_A, TDD_A, FDD_B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

Comparisons between CSI-RSRP of cells on the primary component carrier shall also meet the intra-frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.2. Comparisons between CSI-RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.1.2.

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.35.3-2 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.15.2 for a corresponding Band.

Table 9.1.35.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	CSI Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥ 0 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥ 0 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the CSI-RSRP inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.14.3.2.2.

The relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on a different frequency from another cell or from another TP.

The accuracy requirements in Table 9.1.35.3-3 are valid under the following conditions:

- CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- CSI-RSRP is specified in Annex I.3.17.2 for a corresponding band.

$$\left| CSI\_RSRP1|_{dBm} - CSI\_RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.35.3-3: Inter-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	CSI Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥0 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.35.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.35.3-4: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP_01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP_02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP_95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP_96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP_97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3, 9.1.15.2, and A.9.1.35.

9.1.35.4 Test description

9.1.35.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14 as appropriate.

2. Propagation conditions are set according to Annex B.0.

3. Message contents are defined in clause 9.1.35.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.35.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. The SS activates the SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13 and 6.1.3.8). Wait for at least 2 seconds (Refer to TS 36.133 [4] clauses 8.3.3.2).
5. Set the parameters according to Table 9.1.35.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, the SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.
   The reported CSI-RSRP values of Cell 1 and Cell 2 reported by the UE are compared to actual CSI-RSRP values according to Table 9.1.35.5-2. This counts respectively as a Pass or Fail for the events "Cell 1" and "Cell 2". If the UE fails to report the measurement value for Cell 1 or Cell 2, the number of failed iterations is increased by one.
   The reported CSI-RSRP values of Cell 1 and Cell 2 reported by the UE are compared to the reported CSI-RSRP values of other cells for each MeasurementReport message according to Table 9.1.35.5-3. This counts as a Pass or Fail for the events "Cell 1-2" and "Cell 2-3". If the UE fails to report the measurement value of Cell 1 or Cell 2, the number of failed iterations is increased by one.
10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
11. If the test configuration is inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table E-2 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events "Cell 1", "Cell 2", "Cell 1-2", and "Cell 2-3" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.35.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.35.4.3-1: Common Exception message for CSI-RSRP FDD Carrier Aggregation accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-3 Table H.3.8-4 Table H.3.8-5

Table 9.1.35.4.3-2: *MeasDS-Config-DEFAULT-PCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.35.4.3-3: *MeasDS-Config-DEFAULT-SCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 3	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	6		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.35.4.3-4: *MeasResults-PCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12 SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 9.1.35.4.3-5: *MeasResults-SCell*: Additional CSI-RSRP FDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 2	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 3	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.35.5 Test requirement

Table 9.1.35.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.35.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.35.5-3.

Table 9.1.35.5-1: CSI-RSRP FDD Carrier Aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10	10	10
Timing offset to cell1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
DMTC period		ms	160	160	
DMTC period offset		ms	0	10	
Discovery signal occasion duration		ms	1	1	
CSI-RS resource configuration			2	4	6
CSI-RS periodicity		ms	10	10	10
CSI-RS subframe offset		ms	0	0	0
CSI-RS individual offset[2]		dB	0	0	0
CSI-RS muting			Enable	Enable	Enable
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
p-C-r10[2]		dB	6	6	6
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
CRS $\hat{E}_s/I_{ot}$		dB	-4	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	2	6.46	0.24
RSRP Note3	Bands FDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B		-120.5		
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		

	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
CSI-RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-115	(CSI-RSRP for Cell 1 +8dB)	(CSI-RSRP for Cell 1 +4dB)
	Bands FDD_B		-114.5		
	Bands FDD_C		-114		
	Bands FDD_D		-113.5		
	Bands FDD_E, FDD_F [Note 6]		-113		
	Bands FDD_G		-112		
	Bands FDD_H		-111.5		
Io[Note3]	Bands FDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands FDD_B		-87.26		
	Bands FDD_C		-86.76		
	Bands FDD_D		-86.26		
	Bands FDD_E, FDD_F [Note 6]		-85.76		
	Bands FDD_G		-84.76		
	Bands FDD_H		-84.26		
CRS $\hat{E}_s/N_{oc}$		dB	-4	3	-1
CSI-RS $\hat{E}_s/N_{oc}$		dB	2	9	5
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test.

Table 9.1.35.5-2: CSI-RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_19	CSI_RSRP_20	CSI_RSRP_20	CSI_RSRP_21	CSI_RSRP_21	CSI_RSRP_22	CSI_RSRP_23
Highest reported value (Cell 1)		CSI_RSRP_32	CSI_RSRP_32	CSI_RSRP_33	CSI_RSRP_33	CSI_RSRP_34	CSI_RSRP_35	CSI_RSRP_35
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_28	CSI_RSRP_29	CSI_RSRP_29	CSI_RSRP_30	CSI_RSRP_31
Highest reported value (Cell 2)		CSI_RSRP_40	CSI_RSRP_40	CSI_RSRP_41	CSI_RSRP_41	CSI_RSRP_42	CSI_RSRP_43	CSI_RSRP_43
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_15	CSI_RSRP_15	CSI_RSRP_16	CSI_RSRP_16	CSI_RSRP_17	CSI_RSRP_18	CSI_RSRP_18
Highest reported value (Cell 1)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_37	CSI_RSRP_38	CSI_RSRP_38	CSI_RSRP_39	CSI_RSRP_40
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_23	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_24	CSI_RSRP_25	CSI_RSRP_26	CSI_RSRP_26
Highest reported value (Cell 2)		CSI_RSRP_44	CSI_RSRP_45	CSI_RSRP_45	CSI_RSRP_46	CSI_RSRP_46	CSI_RSRP_47	CSI_RSRP_48
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.								

Table 9.1.35.5-3: CSI-RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 + 2
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 15
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 9
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 – 1
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal

9.1.36.1 Test purpose

The purpose of this test is to verify that the TDD CSI-RSRP absolute and relative measurement accuracies for carrier aggregation in CSI-RS based discovery signal are within the specified limits. This test will verify the absolute CSI-RSRP accuracy requirements of the primary component carrier, the absolute CSI-RSRP accuracy requirements of the secondary component carrier, and the relative CSI-RSRP accuracy requirements of the secondary component carrier. The test will also verify the primary and secondary component carrier relative CSI-RSRP accuracy requirement.

9.1.36.2 Test applicability

This test applies to all types to E-UTRA TDD UE release 12 and forward that supports CA and CSI-RS based discovery signals measurement.

9.1.36.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.35.3

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.14.3, 9.1.15.2, and A.9.1.36.

9.1.36.4 Test description

9.1.36.4.1 Initial conditions

Same initial conditions as in clause 9.1.35.4.1 with the following exception:

- Message contents are defined in clause 9.1.36.4.3.

9.1.36.4.2 Test procedure

Same test procedure as in clause 9.1.35.4.2 with the following exceptions:

- Instead of Table 9.1.35.5-1 → use Table 9.1.36.5-1.
- Instead of Table 9.1.35.5-2 → use Table 9.1.36.5-2.
- Instead of Table 9.1.35.5-3 → use Table 9.1.36.5-3.

9.1.36.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.36.4.3-1: Common Exception message for CSI-RSRP TDD Carrier Aggregation accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.8-3 Table H.3.8-4 Table H.3.8-5

Table 9.1.36.4.3-2: *MeasDS-Config-DEFAULT-PCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	0		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	1 entry		
MeasCSI-RS-Config-r12 SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 1	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	2		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.36.4.3-3: *MeasDS-Config-DEFAULT-SCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1B: MeasDS-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF SEQUENCE {	2 entries		
MeasCSI-RS-Config-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1		
physCellId-r12	PhysCellId of Cell 2	INTEGER(0..503)	
scramblingIdentity-r12	0		
resourceConfig-r12	4		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
MeasCSI-RS-Config-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2		
physCellId-r12	PhysCellId of Cell 3	INTEGER(0..503)	
scramblingIdentity-r12	1		
resourceConfig-r12	6		
subframeOffset-r12	0		
csi-RS-IndividualOffset-r12	dB0		
}			
}			
}			
}			

Table 9.1.36.4.3-4: *MeasResults-PCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for PCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12 SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 1	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

Table 9.1.36.4.3-5: *MeasResults-SCell*: Additional CSI-RSRP TDD Carrier Aggregation accuracy test requirement for SCell

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	2		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultCSI-RS-List-r12 SEQUENCE (SIZE(1..maxCellReport)) OF SEQUENCE {			
MeasResultCSI-RS-r12[0] SEQUENCE {			
measCSI-RS-Id-r12	1	Cell 2	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
MeasResultCSI-RS-r12[1] SEQUENCE {			
measCSI-RS-Id-r12	2	Cell 3	
csi-RSRP-Result-r12	INTEGER(0..97)	Set according to specific test	
}			
}			
}			

9.1.36.5 Test requirement

Table 9.1.36.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.36.5-2.

The CSI-RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.36.5-3.

Table 9.1.36.5-1: CSI-RSRP TDD Carrier Aggregation test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10		
Special subframe configuration[Note1]			6		
Uplink/downlink configuration[Note1]			1		
Timing offset to Cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1	-
DMTC period		ms	160	160	
DMTC period offset		ms	0	10	
Discovery signal occasion duration		ms	2	2	
CSI-RS resource configuration			2	4	6
CSI-RS periodicity		ms	10	10	10
CSI-RS subframe offset		ms	0	0	0
CSI-RS individual offset[2]		dB	0	0	0
CSI-RS muting			Enable	Enable	Enable
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
p-C-r10[2]		dB	6	6	6
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116		
	Bands TDD_E		-115		
CRS $\hat{E}_s/I_{ot}$		dB	-4	0.46	-5.76
CSI-RS $\hat{E}_s/I_{ot}$		dB	2	6.46	0.24
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C		-120		
	Bands TDD_E		-119		
CSI-RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-115	(CSI-RSRP for Cell 1 +8dB)	(CSI-RSRP for Cell 1 +4dB)
	Bands TDD_C		-114		
	Bands TDD_E		-113		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-87.76	(Io for Channel 1 +5.33dB)	
	Bands TDD_C		-86.76		
	Bands TDD_E		-85.76		
CRS $\hat{E}_s/N_{oc}$		dB	-4	3	-1

CSI-RS $\hat{E}_s/N_{oc}$	dB	2	9	5
Propagation condition	-	AWGN		
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe. Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 8: E-UTRA operating band groups are as defined in Section 3.5. Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test.				

Table 9.1.36.5-2: CSI-RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_19	CSI_RSRP_20	CSI_RSRP_21
Highest reported value (Cell 1)		CSI_RSRP_32	CSI_RSRP_33	CSI_RSRP_34
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_27	CSI_RSRP_28	CSI_RSRP_29
Highest reported value (Cell 2)		CSI_RSRP_40	CSI_RSRP_41	CSI_RSRP_42
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	CSI_RSRP_15	CSI_RSRP_16	CSI_RSRP_17
Highest reported value (Cell 1)		CSI_RSRP_36	CSI_RSRP_37	CSI_RSRP_38
Lowest reported value (Cell 2)	Cell 2	CSI_RSRP_23	CSI_RSRP_24	CSI_RSRP_25
Highest reported value (Cell 2)		CSI_RSRP_44	CSI_RSRP_45	CSI_RSRP_46
Note: The band of Cell 1 determines the levels for both Cell 1 and Cell 2, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2.				

Table 9.1.36.5-3: CSI-RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 8
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 – 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 + 2
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 15
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	CSI_RSRP_Cell 1 – 9
Highest reported value (Cell 2)		CSI_RSRP_Cell 1 + 1
Lowest reported value (Cell 3)	Cell 2-3	CSI_RSRP_Cell 2 – 1
Highest reported value (Cell 3)		CSI_RSRP_Cell 2 + 17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.37 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation

9.1.37.1 Test purpose

To verify that TDD-FDD RSRP absolute and relative measurement accuracy in carrier aggregation with PCell in FDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.37.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 3DL CA with FDD as PCell.

9.1.37.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The absolute accuracy requirements in table 9.1.37.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.37.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.37.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.37.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW Channel
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.37.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.37.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW Channel
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.37.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.37.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.37.

9.1.37.4 Test description

9.1.37.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.37.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.66 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.37.4.3.
4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on SCC1, and Cell 3 is the neighbouring cell on SCC1. Cell 4 is SCell on SCC2, and Cell 5 is the neighbouring cell on SCC2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

9.1.37.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCells (cell 2 and cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.37.4.3].
4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.1.37.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

The reported RSRP values for Cell 1, Cell 2 and Cell 4 are compared to the actual RSRP values according to Table 9.1.37.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 4”. If the UE fails to report the measurement value for Cell 2 or Cell 4, the number of failed iterations for the respective event is increased by one.

The reported RSRP value for Cell 2, Cell 4, Cell 3 and Cell 5 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.37.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 2-3”, and “Cell 4-5”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 1-2”, “Cell 1-4”, “Cell 2-3”, and “Cell 4-5” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.37.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.37.4.3-1: Common Exception messages for FDD RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.37.5 Test requirement

Table 9.1.37.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.37.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.37.5-3.

Table 9.1.37.5-1: 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation test parameters

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number			1	2		3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			-	6		6	
Uplink/downlink configuration[Note1]			-	1		1	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB		dB	0	0	0	0	0
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA[Note2]							
OCNG_RB[Note2]							
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB)		(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-117	-		-	
	Bands FDD_B		-116.5				
	Bands FDD_C		-116				
	Bands FDD_D		-115.5				
	Bands FDD_E, FDD_F [Note 7]		-115				
	Bands FDD_G		-114				
	Bands FDD_H		-113.5				
$\hat{E}_s / N_{oc}$		dB	-4	3	-0.2	3	-0.2
$\hat{E}_s / I_{ot}$		dB	-4	0.09	-4.96	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15	-	(RSRP for Cell	(RSRP for	(RSRP for	(RSRP for

	Bands TDD_C	kHz		1 +8dB)	Cell 1 +4.8dB)	Cell 1 +8dB)	Cell 1 +4.8dB)
	Bands TDD_E						
	Bands FDD_A		-121				
	Bands FDD_B		-120.5				
	Bands FDD_C		-120				
	Bands FDD_D		-119.5				
	Bands FDD_E, FDD_F Note 7		-119	-	-	-	-
	Bands FDD_G		-118				
	Bands FDD_H		-117.5				
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-87.76+10log($N_{RB,c}$/50)	-		-	
	Bands FDD_B		-87.26+10log($N_{RB,c}$/50)				
	Bands FDD_C		-86.76+10log($N_{RB,c}$/50)				
	Bands FDD_D		-86.26+10log($N_{RB,c}$/50)				
	Bands FDD_E, FDD_F Note 7		-85.76 +10log($N_{RB,c}$/50)				
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)				
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)				
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3	0	3
Time alignment error relative to cell 1 Note 8			-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2 Note 8			-	-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.37.5-2: 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2 and Cell 4, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2 or Cell 4.								

Table 9.1.37.5-3: 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 – 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 – 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.38 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation

9.1.38.1 Test purpose

To verify that TDD-FDD RSRP absolute and relative measurement accuracy in carrier aggregation with PCell in TDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.38.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 3DL CA with TDD as PCell.

9.1.38.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.37.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.38.

9.1.38.4 Test description

9.1.38.4.1 Initial conditions

Same initial conditions as in clause 9.1.37.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.38.4.3.

9.1.38.4.2 Test procedure

Same test procedure as in clause 9.1.37.4.2 with the following exceptions:

- Instead of Table 9.1.37.5-1 → use Table 9.1.38.5-1.
- Instead of Table 9.1.37.5-2 → use Table 9.1.38.5-2.
- Instead of Table 9.1.37.5-3 → use Table 9.1.38.5-3.

9.1.38.4.3 Message contents

Same message contents as in clause 9.1.37.4.3.

9.1.38.5 Test requirement

Table 9.1.38.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.38.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.38.5-3.

Table 9.1.38.5-1: 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation test parameters

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number			1	2		3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			6	-		-	
Uplink/downlink configuration[Note1]			1	-		-	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA		dB	0	0	0	0	0
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA[Note1]							
OCNG_RB[Note1]							
N_{oc} [Note3]	Bands FDD_A	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB)		(N_{oc} for Channel 1 +1dB)	
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D						
	Bands FDD_E, FDD_F [Note 7]						
	Bands FDD_G						
	Bands FDD_H						
	Bands TDD_A		-117	-		-	
	Bands TDD_C		-116				
	Bands TDD_E		-115				
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2	3	-0.2

$\hat{E}_s/I_{ot}$		dB	-4	0.09	-4.96	0.09	-4.96
RSRP[Note4]	Bands FDD_A	dBm/15 kHz	-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D						
	Bands FDD_E, FDD_F [Note 7]						
	Bands FDD_G						
	Bands FDD_H						
	Bands TDD_A		-121	-	-	-	-
	Bands TDD_C		-120				
	Bands TDD_E		-119				
Io[Note4]	Bands FDD_A	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D						
	Bands FDD_E, FDD_F [Note 7]						
	Bands FDD_G						
	Bands FDD_H						
	Bands TDD_A		-87.76+10log($N_{RB,c}$/50)	-		-	
	Bands TDD_C		-86.76+10log($N_{RB,c}$/50)				
	Bands TDD_E		-85.76+10log($N_{RB,c}$/50)				
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3	0	3
Time alignment error relative to cell 1 [Note 8]			-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2[Note8]			-	-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.38.5-2: 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2 and Cell 4, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2 or Cell 4.				

Table 9.1.38.5-3: 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 – 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 – 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.39 3DL FDD RSRP for E-UTRAN in Carrier Aggregation

9.1.39.1 Test purpose

To verify that FDD absolute and relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.39.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and 11 that support 3DL with Intra-band contiguous CA, or 3DL with Inter-band CA, or 3DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA FDD UE release 11 that support 3DL with Intra-band non-contiguous and Inter-band CA, or 3DL with Intra-band non-contiguous and Intra-band contiguous CA.

9.1.39.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.39.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports
- Conditions defined in 36.101[2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP_{|dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.39.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The FDD RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.39.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2_{|dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.39.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.39.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.39.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.39.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.39.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.39.

9.1.39.4 Test description

9.1.39.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.39.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.66 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.39.4.3.

4. Cell 1 is PCell on channel 1, and cell 2 and cell 4 are activated SCells on secondary component carriers SCC1 and SCC2 respectively. Cell 3 and cell 5 are neighbouring cells on secondary component carriers SCC1 and SCC2 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

9.1.39.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2 and Cell 4) on the SCC1 and SCC2 as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 9.1.39.5-1 and 9.1.39.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2 and Cell 4 are compared to the actual RSRP values according to Table 9.1.39.5-3. These count respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 4”. If the UE fails to report the measurement value for Cell 1, Cell 2 or Cell 4, the number of failed iterations for the respective event is increased by one.

The reported RSRP values for Cell 2, Cell 4, Cell 3 and Cell 5 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.39.5-4. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 2-3”, and “Cell 4-5”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table E-2 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 1-2”, “Cell 1-4”, “Cell 2-3”, and “Cell 4-5” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.39.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.39.4.3-1: Common Exception messages for FDD RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.39.5 Test requirement

Tables 9.1.39.5-1 and 9.1.39.5-2 define the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.39.5-3.

The RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.39.5-4.

Table 9.1.39.5-1: 3 DL FDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #1, cell #2 and cell #3)

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15kHz	-117	(N_{oc} for Channel 1 +1dB)	
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2
$\hat{E}_s/I_{ot}$		dB	-4	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands FDD_C		-120		
	Bands FDD_D		-119.5		
	Bands FDD_E, FDD_F Note 6		-119		
	Bands FDD_G		-118		
	Bands FDD_H		-117.5		
Io Note3	Bands FDD_A	dBm/$BW_{channel}$	-87.76 +10log($N_{RB,c}$/50)	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50)		
	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50)		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50)		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)		
	Bands FDD_H		-84.26		

			+10log($N_{RB,c}$/50)		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 7			-	≤ TAE	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.39.5-2: 3 DL FDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #4 and cell #5)

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0
N_{oc} Note2	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(N_{oc} for Channel 1 +1dB)	
$\hat{E}_s/N_{oc}$		dB	3	-0.2
$\hat{E}_s/I_{ot}$		dB	0.09	-4.96
RSRP Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
Io Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/$BW_{channel}$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	0	3

Time alignment error relative to cell 1 Note 7		≤ TAE	-
Time alignment error relative to cell 2 Note 7		≤ TAE	-
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 8: E-UTRA operating band groups are as defined in Section 3.5.			

Table 9.1.39.5-3: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions							
Lowest reported value (Cell 1)	Cell 1	RSRP_12	RSRP_13	RSRP_13	RSRP_14	RSRP_15	RSRP_15
Highest reported value (Cell 1)		RSRP_27	RSRP_28	RSRP_29	RSRP_29	RSRP_30	RSRP_31
Lowest reported value (Cell 2)	Cell 2	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 2)		RSRP_35	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Lowest reported value (Cell 4)	Cell 4	RSRP_20	RSRP_21	RSRP_21	RSRP_22	RSRP_23	RSRP_23
Highest reported value (Cell 4)		RSRP_35	RSRP_36	RSRP_37	RSRP_37	RSRP_38	RSRP_39
Extreme Conditions							
Lowest reported value (Cell 1)	Cell 1	RSRP_09	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2 and Cell 4, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2 or Cell 4.							

Table 9.1.39.5-4: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.39_1 3DL FDD RSRP for E-UTRAN in Carrier Aggregation(Rel-12 and forward)

9.1.39_1.1 Test purpose

Same test purpose as in clause 9.1.39.1.

9.1.39_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward supporting 3DL CA.

9.1.39_1.3 Minimum conformance requirements

The FDD RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.39_1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.39_1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.39_1.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.39_1.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.39_1.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.39_1.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.39.1_1.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.39_1.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.39.

9.1.39_1.4 Test description

9.1.39_1.4.1 Initial conditions

Same initial conditions as in clause 9.1.39.4.1 with the following exceptions:

- Instead of clause 9.1.39.4.3 → use clause 9.1.39_1.4.3.

9.1.39_1.4.2 Test procedure

Same test procedure as in clause 9.1.39.4.2 with the following exceptions:

- Instead of Table 9.1.39.5-3 → use Table 9.1.39_1.5-1.
- Instead of Table 9.1.39.5-4 → use Table 9.1.39_1.5-2.

9.1.39_1.4.3 Message contents

Same message contents as in clause 9.1.39.4.3.

9.1.39_1.5 Test requirement

Same test requirements as in clause 9.1.39.5 with the following exceptions:

- Instead of Table 9.1.39.5-3 → use Table 9.1.39_1.5-1.
- Instead of Table 9.1.39.5-4 → use Table 9.1.39_1.5-2.

Table 9.1.39_1.5-1: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_14	RSRP_15	RSRP_15	RSRP_16	RSRP_17
Highest reported value (Cell 1)		RSRP_26	RSRP_26	RSRP_27	RSRP_27	RSRP_28	RSRP_29	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 2)		RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_22	RSRP_23	RSRP_23	RSRP_24	RSRP_25
Highest reported value (Cell 4)		RSRP_34	RSRP_34	RSRP_35	RSRP_35	RSRP_36	RSRP_37	RSRP_37
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_9	RSRP_10	RSRP_10	RSRP_11	RSRP_12	RSRP_12
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_31	RSRP_32	RSRP_32	RSRP_33	RSRP_34
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_17	RSRP_18	RSRP_18	RSRP_19	RSRP_20	RSRP_20
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_39	RSRP_40	RSRP_40	RSRP_41	RSRP_42
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2 and Cell 4, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2 or Cell 4.								

Table 9.1.39_1.5-2: RSRP FDD for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 +2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 – 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 – 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

9.1.40 3DL TDD RSRP Accuracy for E-UTRA in Carrier Aggregation

9.1.40.1 Test purpose

To verify the TDD RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.40.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and 11 that support 3DL Intra-band contiguous CA or 3DL Inter-band CA, or 3DL Intra-band contiguous with Inter-band CA.

This test case also applies to all types of E-UTRA TDD UE release 11 that support 3DL Intra-band non-contiguous with Inter-band CA, or 3DL Intra-band non-contiguous with Intra-band contiguous CA.

9.1.40.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier 1 and 2 shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.40.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.40.3-1: RSRP TDD absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.40.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.40.3-2: TDD RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 5	dBm/BW_{Channel}
±6	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5 Note 3	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition has the minimum Io of -119 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 4: Band 29 is used only for E-UTRA carrier aggregation with other E-UTRA bands.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.40.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.40.3-3 for SCCs relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.40.3-3: TDD RSRP relative accuracy for SCCs

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW_{Channel}
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.4, and A.9.1.40.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.40.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.40.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.40.

9.1.40.4 Test description

9.1.40.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.40.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.66 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.40.4.3.
4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on SCC1, and Cell 3 is the neighbouring cell on SCC1, Cell 4 is SCell on SCC2, and Cell 5 is the neighbouring cell on SCC2. Cell 1 is used for connection setup with the power level set according to Annex C.0 and C.1. Cell 2, Cell 3, Cell 4 and Cell 5 shall be powered OFF.

9.1.40.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC 1 and SCC 2 according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell 1 (Cell 2) and SCell 2 (Cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.40.4.3].
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.1.40.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. The SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages. The reported RSRP values for Cell 1, Cell 2 and Cell 4 are compared to the actual RSRP values

according to Table 9.1.40.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 4”. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 4, the number of failed iterations for the respective event is increased by one.

The reported RSRP value for Cell 2, Cell 3, Cell 4 and Cell 5 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.40.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 2-3”, and “Cell 4-5”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table E-2 according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 1-2”, “Cell 1-4”, “Cell 2-3” and “Cell 4-5” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.40.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.40.4.3-1: Common Exception messages for 3DL TDD RSRP Accuracy for E-UTRA Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.40.5 Test requirement

Table 9.1.40.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.40.5-2.

Table 9.1.40.5-1: 3 DL TDD RSRP absolute accuracy carrier aggregation test parameters

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number			1	2		3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			6				
Uplink/downlink configuration[Note1]			1				
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15kHz	-117	(N_{oc} for Channel 1 +1dB)		(N_{oc} for Channel 1 +1dB)	
	Bands TDD_C		-116				
	Bands TDD_E		-115				
$\hat{E}_s/N_{oc}$		dB	-4	3	-0.2	3	-0.2
$\hat{E}_s/I_{ot}$		dB	-4	0.09	-4.96	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15kHz	-121	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4.8dB)
	Bands TDD_C		-120				

	Bands TDD_E		-119				
Io[Note4]	Bands TDD_A	dBm/ $BW_{channel}$	-87.76 + $10\log(N_{RB,c}/50)$	(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.51dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C		-86.76 + $10\log(N_{RB,c}/50)$				
	Bands TDD_E		-85.76 + $10\log(N_{RB,c}/50)$				
Propagation Condition			AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	3	0	3
Time alignment error relative to cell 1 [Note 7]			-	≤ TAE	-	≤ TAE	-
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 8: E-UTRA operating band groups are as defined in Section 3.5.							

Table 9.1.40.5-2: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_12	RSRP_13	RSRP_14
Highest reported value (Cell 1)		RSRP_27	RSRP_28	RSRP_29
Lowest reported value (Cell 2)	Cell 2	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 2)		RSRP_35	RSRP_36	RSRP_37
Lowest reported value (Cell 4)	Cell 4	RSRP_20	RSRP_21	RSRP_22
Highest reported value (Cell 4)		RSRP_35	RSRP_36	RSRP_37
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_09	RSRP_10	RSRP_11
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2 and Cell 4, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2 or Cell 4.				

Table 9.1.40.5-3: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 - 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 - 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 - 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 - 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.40_1 3DL TDD RSRP Accuracy for E-UTRA in Carrier Aggregation (Rel-12 and forward)

9.1.40_1.1 Test purpose

Same test purpose as defined in clause 9.1.40.1.

9.1.40_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward supporting 3DL CA.

9.1.40_1.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier 1 and 2 shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.40_1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.40_1.3-1: RSRP absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW Channel	dBm/BW Channel
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The TDD RSRP relative measurements of cells on the SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.40_1.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27 dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.40_1.3-2: RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW Channel
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.40.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.40_1.3-3 for SCCs relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.40_1.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.4, and A.9.1.40.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.40_1.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.40_1.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.40.

9.1.40_1.4 Test description

9.1.40_1.4.1 Initial conditions

Same initial conditions as defined in clause 9.1.40.4.1.

9.1.40_1.4.2 Test procedure

Same test procedure as defined in clause 9.1.40.4.2 with the following exceptions:

- Instead of Table 9.1.40.5-2 → use Table 9.1.40_1.5-1.
- Instead of Table 9.1.40.5-3 → use Table 9.1.40_1.5-2.

9.1.40_1.4.3 Message contents

Same message contents as defined in clause 9.1.40.4.3

9.1.40_1.5 Test requirement

Same test requirements as in clause 9.1.40.5 with the following exceptions:

- Instead of Table 9.1.40.5-2 → use Table 9.1.40_1.5-1.
- Instead of Table 9.1.40.5-3 → use Table 9.1.40_1.5-2.

Table 9.1.40_1.5-1: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_13	RSRP_14	RSRP_15
Highest reported value (Cell 1)		RSRP_26	RSRP_27	RSRP_28
Lowest reported value (Cell 2)	Cell 2	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 2)		RSRP_34	RSRP_35	RSRP_36
Lowest reported value (Cell 4)	Cell 4	RSRP_21	RSRP_22	RSRP_23
Highest reported value (Cell 4)		RSRP_34	RSRP_35	RSRP_36
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_9	RSRP_10	RSRP_11
Highest reported value (Cell 1)		RSRP_30	RSRP_31	RSRP_32
Lowest reported value (Cell 2)	Cell 2	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 2)		RSRP_38	RSRP_39	RSRP_40
Lowest reported value (Cell 4)	Cell 4	RSRP_17	RSRP_18	RSRP_19
Highest reported value (Cell 4)		RSRP_38	RSRP_39	RSRP_40
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2 and Cell 4, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2 or Cell 4.				

Table 9.1.40_1.5-2: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + 2
Highest reported value (Cell 2)		RSRP_Cell 1 + 15
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + 2
Highest reported value (Cell 4)		RSRP_Cell 1 + 15
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 1
Highest reported value (Cell 2)		RSRP_Cell 1 + 17
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 – 1
Highest reported value (Cell 4)		RSRP_Cell 1 + 17
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – 8
Highest reported value (Cell 3)		RSRP_Cell 2 + 1
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 – 8
Highest reported value (Cell 5)		RSRP_Cell 4 + 1

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.41 FD-FDD Intra frequency RSRP Accuracy for UE category 0

9.1.41.1 FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0

9.1.41.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.41.1.2 Test applicability

This test applies to E-UTRA FD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.41.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in table 9.1.41.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.41.1.3-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±7	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.41.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.41.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.1, clause 9.1.4 and A.9.1.41.

9.1.41.1.4 Test description

9.1.41.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.41.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.41.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.41.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.41.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.41.1.5-1 as appropriate.

9.1.41.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.41.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.41.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.41.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.41.1.5 Test requirement

Table 9.1.41.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.41.1.5-2.

Table 9.1.41.1.5-1: FD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.3			R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 4						-114	
	Bands FDD_G Note 6						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F Note 4						-111	-114.2
	Bands FDD_G Note 6						-110	-113.2
	Bands FDD_H						-109.5	-112.7
Io Note3	Bands FDD_A	dBm/9 MHz	*-71.05*		-51.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 4						-80.25	
	Bands FDD_G Note 6						-79.25	
	Bands FDD_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.41.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD_A	RSRP_16
			Bands FDD_B	RSRP_16
			Bands FDD_C	RSRP_17
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_18
			Bands FDD_G	RSRP_19
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD_A	RSRP_33
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_34
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_35
			Bands FDD_G	RSRP_36
			Bands FDD_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.41.2 FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0

9.1.41.2.1 Test purpose

To verify that the FD-FDD intra-frequency relative RSRP measurement accuracy is within the specified limit for all bands.

9.1.41.2.2 Test applicability

This test applies to all types of E-UTRA FD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.41.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.41.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.41.2.3-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.41.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.41.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.2, clause 9.1.4 and A.9.1.41.

9.1.41.2.4 Test description

9.1.41.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.41.2.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.41.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.1.41.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.41.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.41.2.5-1 as appropriate.

9.1.41.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.41.2.4.3-1: Common Exception messages for RSRP FD-FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.41.2.4.3-2: *MeasResults*: Additional RSRP FD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.41.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.41.2.5 Test requirement

Table 9.1.41.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FD-FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.41.2.5-2.

Table 9.1.41.2.5-1: FD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	**Cell 2**	**Cell 1**	**Cell 2**	**Cell 1**	**Cell 2**
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.3			R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 4						-114	
	Bands FDD_G Note 6						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	0
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-100	-104	-81	-85	-113	-116
	Bands FDD_B						-112.5	-115.5
	Bands FDD_C						-112	-115
	Bands FDD_D						-111.5	-114.5
	Bands FDD_E, FDD_F Note 4						-111	-114
	Bands FDD_G Note 6						-110	-113
	Bands FDD_H						-109.5	-112.5
Io Note3	Bands FDD_A	dBm/9 MHz	-70.05		-51.05		-82.20	
	Bands FDD_B						-81.70	
	Bands FDD_C						-81.20	
	Bands FDD_D						-80.70	
	Bands FDD_E, FDD_F Note 4						-80.20	
	Bands FDD_G Note 6						-79.20	
	Bands FDD_H						-78.70	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.41.2.5-2: RSRP FD-FDD Intra frequency relative accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_D	RSRP_x+3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_H	RSRP_x+3
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				
Note 2: RSRP_x is the reported value of Cell 1				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.42 HD-FDD Intra frequency RSRP Accuracy for UE category 0

9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0

9.1.42.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.42.1.2 Test applicability

This test applies to all types of E-UTRA HD-FDD operation Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.42.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in table 9.1.42.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.42.1.3-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
±7	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.42.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.42.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.1, clause 9.1.4 and A.9.1.42.

9.1.42.1.4 Test description

9.1.42.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.42.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.42.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.42.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.42.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.42.1.5-1 as appropriate.

9.1.42.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.42.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.42.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.42.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.42.1.5 Test requirement

Table 9.1.42.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.42.1.5-2.

Table 9.1.42.1.5-1: HD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.4			R.1 HD-FDD	-	R.1 HD-FDD	-	R.1 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.3			R.3 HD-FDD		R.3 HD-FDD		R.3 HD-FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.20
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112	-115.20
	Bands FDD_D						-111.5	-114.70
	Bands FDD_E, FDD_F Note 4						-111	-114.20
	Bands FDD_G Note 6						-110	-113.20
	Bands FDD_H						-109.5	-112.70
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 4						-80.25	
	Bands FDD_G Note 6						-79.25	
	Bands FDD_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.								

Note 3:	Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.42.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD_A	RSRP_16
			Bands FDD_B	RSRP_16
			Bands FDD_C	RSRP_17
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_18
			Bands FDD_G	RSRP_19
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD_A	RSRP_33
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_34
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_35
			Bands FDD_G	RSRP_36
			Bands FDD_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0

9.1.42.2.1 Test purpose

To verify that the HD-FDD intra-frequency relative RSRP measurement accuracy is within the specified limit for all bands.

9.1.42.2.2 Test applicability

This test applies to all types of E-UTRA HD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.42.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.42.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.42.2.3-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.42.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.42.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.2, clause 9.1.4 and A.9.1.42.

9.1.42.2.4 Test description

9.1.42.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.42.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.42.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.42.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.42.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.42.2.5-1 as appropriate.

9.1.42.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.42.2.4.3-1: Common Exception messages for RSRP HD-FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.42.2.4.3-2: *MeasResults*: Additional RSRP HD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.42.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP HD-FDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.42.2.5 Test requirement

Table 9.1.42.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.42.2.5-2.

Table 9.1.42.2.5-1: HD-FDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.4			R.1 HD-FDD	-	R.1 HD-FDD	-	R.1 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.3			R.3 HD-FDD		R.3 HD-FDD		R.3 HD-FDD	
OCNG Patterns defined in D.1			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-106		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	0
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note3	Bands FDD_A	dBm/15 kHz	-100	-104	-81	-85	-113	-116
	Bands FDD_B						-112.5	-115.5
	Bands FDD_C						-112	-115
	Bands FDD_D						-111.5	-114.5
	Bands FDD_E, FDD_F Note 4						-111	-114
	Bands FDD_G Note 6						-110	-113
	Bands FDD_H						-109.5	-112.5
Io Note3	Bands FDD_A	dBm/9 MHz	-70.05		-51.05		-82.20	
	Bands FDD_B						-81.70	
	Bands FDD_C						-81.20	
	Bands FDD_D						-80.70	
	Bands FDD_E, FDD_F Note 4						-80.20	
	Bands FDD_G Note 6						-79.20	
	Bands FDD_H						-78.70	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are

	not settable parameters themselves.
Note 4:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.42.2.5-2: RSRP HD-FDD Intra frequency relative accuracy requirements for the reported values

Normal Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_D	RSRP_x+3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands FDD_A	RSRP_x-9
			Bands FDD_B	RSRP_x-9
			Bands FDD_C	RSRP_x-9
			Bands FDD_D	RSRP_x-9
			Bands FDD_E, FDD_F	RSRP_x-9
			Bands FDD_G	RSRP_x-9
			Bands FDD_H	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands FDD_A	RSRP_x+3
			Bands FDD_B	RSRP_x+3
			Bands FDD_C	RSRP_x+3
			Bands FDD_D	RSRP_x+3
			Bands FDD_E, FDD_F	RSRP_x+3
			Bands FDD_G	RSRP_x+3
			Bands FDD_H	RSRP_x+3
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				
Note 2: RSRP_x is the reported value of Cell 1				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.43 TDD Intra frequency RSRP Accuracy for UE category 0

9.1.43.1 TDD Intra Frequency Absolute RSRP Accuracy for UE category 0

9.1.43.1.1 Test purpose

To verify that the TDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.43.1.2 Test applicability

This test applies to all types of E-UTRA TDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.43.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category 0.

The accuracy requirements in table 9.1.43.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.43.1.3-1: RSRP Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±7	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.43.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.43.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.1, clause 9.1.4 and A.9.1.43.

9.1.43.1.4 Test description

9.1.43.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.43.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.43.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.43.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.43.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.43.1.5-1 as appropriate.

9.1.43.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.43.1.4.3-1: Common Exception messages for RSRP TDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.43.1.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.43.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.43.1.5 Test requirement

Table 9.1.43.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.43.1.5-2.

Table 9.1.43.1.5-1: TDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.5			R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-1076		-87		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.20
	Bands TDD_C						-112	-115.20
	Bands TDD_E						-111	-114.20
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.43.1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands TDD_A	RSRP_16
			Bands TDD_C	RSRP_17
			Bands TDD_E	RSRP_18
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands TDD_A	RSRP_33
			Bands TDD_C	RSRP_34
			Bands TDD_E	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands TDD_A	RSRP_13
			Bands TDD_C	RSRP_14
			Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands TDD_A	RSRP_36
			Bands TDD_C	RSRP_37
			Bands TDD_E	RSRP_38
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0

9.1.43.2.1 Test purpose

To verify that the TDD intra-frequency relative RSRP measurement accuracy is within the specified limit for all bands.

9.1.43.2.2 Test applicability

This test applies to all types of E-UTRA TDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.1.43.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category 0 UE.

The accuracy requirements in Table 9.1.43.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2|dBm according to Annex I.3.8 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.43.2.3-1: RSRP Intra frequency relative accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.43.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.43.2.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.2, clause 9.1.4 and A.9.1.43.

9.1.43.2.4 Test description

9.1.43.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.43.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.43.2.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.1.43.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRP value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.43.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.43.2.5-1 as appropriate.

9.1.43.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.43.2.4.3-1: Common Exception messages for RSRP TDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.43.2.4.3-2: *MeasResults*: Additional RSRP TDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.43.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD Intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.43.2.5 Test requirement

Table 9.1.43.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.43.2.5-2.

Table 9.1.43.2.5-1: TDD RSRP Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration Note1			6		6		6	
Uplink/downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.5			R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-106		-87		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	0
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note4	Bands TDD_A	dBm/15 kHz	-100	-104	-81	-85	-113	-116
	Bands TDD_C						-112	-115
	Bands TDD_E						-111	-114
Io Note4	Bands TDD_A	dBm/9 MHz	-70.05		-51.05		-82.20	
	Bands TDD_C						-81.20	
	Bands TDD_E						-80.20	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.43.2.5-2: RSRP TDD Intra frequency relative accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands TDD_A	RSRP_x-9
			Bands TDD_C	RSRP_x-9
			Bands TDD_E	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands TDD_A	RSRP_x+3
			Bands TDD_C	RSRP_x+3
			Bands TDD_E	RSRP_x+3
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_x-10	RSRP_x-10	Bands TDD_A	RSRP_x-9
			Bands TDD_C	RSRP_x-9
			Bands TDD_E	RSRP_x-9
Highest reported value (Cell 2)	RSRP_x+2	RSRP_x+2	Bands TDD_A	RSRP_x+3
			Bands TDD_C	RSRP_x+3
			Bands TDD_E	RSRP_x+3
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				
Note 2: RSRP_x is the reported value of Cell 1.				

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.44 4 DL CA PCell in FDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.1.44.1 Test purpose

To verify that TDD-FDD RSRP absolute and relative measurement accuracy in carrier aggregation with PCell in FDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.44.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 4DL CA with FDD as PCell.

9.1.44.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The absolute accuracy requirements in table 9.1.44.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.

- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.44.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.44.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.44.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.44.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.44.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.44.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.44.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.44.

9.1.44.4 Test description

9.1.44.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.44.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure TBD as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.44.4.3.

4. Cell 1 is PCell on the primary component carrier, and Cell 2, Cell 4 and Cell 6 are activated SCells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 3, Cell 5 and Cell 7 are neighbouring cells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, and Cell 7 shall be powered OFF.

9.1.44.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.

3. The SS shall configure SCells (cell 2, cell 4, and cell 6) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.44.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.1.44.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4 and Cell 6 are compared to the actual RSRP values according to Table 9.1.44.5-2. This counts respectively as a Pass or Fail for the events "Cell 1", "Cell 2", "Cell 4", and "Cell 6". If the UE fails to report the measurement value for Cell 2 or Cell 4 or Cell 6, the number of failed iterations for the respective event is increased by one.

   The reported RSRP value for Cell 2, Cell 3, Cell 4, Cell5, Cell 6, and Cell 7 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.44.5-3. These count respectively as a Pass or Fail for the events "Cell 1-2", "Cell 1-4", "Cell 1-6", "Cell 2-3", "Cell 4-5", and "Cell 6-7". If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell6, or Cell 7, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1", "Cell 2", "Cell 4", "Cell 6", "Cell 1-2", "Cell 1-4", "Cell 1-6", "Cell 2-3", "Cell 4-5", and "Cell 6-7" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.44.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.44.4.3-1: Common Exception messages for FDD RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.44.5 Test requirement

Table 9.1.44.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.44.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.44.5-3.

Table 9.1.44.5-1: 4DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation test parameters

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 7
E-UTRA RF Channel Number			1	2		3		4	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			-	6		6		6	
Uplink/downlink configuration[Note1]			-	1		1		1	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT	
	Bands FDD_A		-117+TT	-		-		-	
	Bands FDD_B		-116.5+TT						
	Bands FDD_C		-116+TT						
	Bands		-115.5+TT						

	FDD_D								
	Bands FDD_E, FDD_F Note 7		-115+TT						
	Bands FDD_G		-114+TT						
	Bands FDD_H		-113.5+TT						
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-1+TT	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	-4+TT	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
RSRP Note4	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15 kHz	-	(RSRP for Cell 1 +8dB+TT)	(RSRP for Cell 1 +4dB+TT)	(RSRP for Cell 1 +8dB+TT)	(RSRP for Cell 1 +4dB+TT)	(RSRP for Cell 1 +8dB+TT)	(RSRP for Cell 1 +4dB+TT)
	Bands FDD_A		-121+TT	-	-	-	-	-	-
	Bands FDD_B		-120.5+TT						
	Bands FDD_C		-120+TT						
	Bands FDD_D		-119.5+TT						
	Bands FDD_E, FDD_F Note 7		-119+TT						
	Bands FDD_G		-118+TT						
	Bands FDD_H		-117.5+TT						
Io Note4	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel1}$)) +TT		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel1}$)) +TT		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel4}$ / $N_{RB\ channel1}$)) +TT	
	Bands FDD_A		-87.76+10log($N_{RB,c}$/50) +TT	-		-		-	
	Bands FDD_B		-87.26+10log($N_{RB,c}$/50) +TT						
	Bands FDD_C		-86.76+10log($N_{RB,c}$/50) +TT						
	Bands FDD_D		-86.26+10log($N_{RB,c}$/50) +TT						
	Bands FDD_E, FDD_F Note 7		-85.76 +10log($N_{RB,c}$/50) +TT						
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50) +TT						
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50) +TT						
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3	0	3	0	3
Time alignment error relative to cell 1 Note 8			-	≤ TAE	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2 Note 8			-	-	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 4 Note 8			-	-	-	-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over

	subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.44.5-2: 4DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4, and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.								

Table 9.1.44.5-3: 4DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 + [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 + [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 + [TBD]
Highest reported value (Cell 7)		RSRP_Cell 6 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.45 4 DL CA PCell in TDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.1.45.1 Test purpose

To verify that TDD-FDD RSRP absolute and relative measurement accuracy in carrier aggregation with PCell in TDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.45.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 4DL CA with TDD as PCell.

9.1.45.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.44.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.45.

9.1.45.4 Test description

9.1.45.4.1 Initial conditions

Same initial conditions as in clause 9.1.44.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.45.4.3.

9.1.45.4.2 Test procedure

Same test procedure as in clause 9.1.44.4.2 with the following exceptions:

- Instead of Table 9.1.44.5-1 → use Table 9.1.45.5-1.
- Instead of Table 9.1.44.5-2 → use Table 9.1.45.5-2.
- Instead of Table 9.1.44.5-3 → use Table 9.1.45.5-3.

9.1.45.4.3 Message contents

Same message contents as in clause 9.1.44.4.3.

9.1.45.5 Test requirement

Table 9.1.45.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.45.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.45.5-3.

Table 9.1.45.5-1: 4DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation test parameters

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 7
E-UTRA RF Channel Number		1	2		3		4	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]		6	-		-		-	
Uplink/downlink configuration[Note1]		1	-		-		-	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2.		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]	dB	0	0	0	0	0	0	0
N_{oc} [Note3] Bands FDD_A Bands FDD_B Bands FDD_C Bands	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB)+TT		(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT	(N_{oc} for Channel 1 +1dB) +TT

	FDD_D								
	Bands FDD_E, FDD_F Note 7								
	Bands FDD_G								
	Bands FDD_H								
	Bands TDD_A		-117+TT	-		-		-	
	Bands TDD_C		-116+TT						
	Bands TDD_E		-115+TT						
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-1+TT	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	-4+TT	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
RSRP Note4	Bands FDD_A	dBm/15 kHz	-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands FDD_B								
	Bands FDD_C								
	Bands FDD_D								
	Bands FDD_E, FDD_F Note 7								
	Bands FDD_G								
	Bands FDD_H								
	Bands TDD_A		-121	-	-	-	-	-	-
	Bands TDD_C		-120						
	Bands TDD_E		-119						
Io Note4	Bands FDD_A	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel4}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_B								
	Bands FDD_C								
	Bands FDD_D								
	Bands FDD_E, FDD_F Note 7								
	Bands FDD_G								
	Bands FDD_H								
	Bands TDD_A		-87.76+10log($N_{RB,c}$/50)	-		-		-	
	Bands TDD_C		-86.76+10log($N_{RB,c}$/50)						
	Bands TDD_E		-85.76+10log($N_{RB,c}$/50)						
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3	0	3	0	3
Time alignment error relative to cell 1 Note 8			-	≤ TAE	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2 Note8			-	-	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 4 Note8			-	-	-	-	-	≤ TAE	-

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.45.5-2: 4DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4, and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4, or Cell 6.				

Table 9.1.45.5-3: 4DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 + [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 + [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 + [TBD]
Highest reported value (Cell 7)		RSRP_Cell 6 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.46 4DL FDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

- Annex E needs to be updated

- The test applicability needs to be added to TS36.521-2

9.1.46.1 Test purpose

To verify that FDD absolute and relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.46.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL Intra-band contiguous CA, or 4DL Inter-band CA, or 4DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 4DL with Intra-band non-contiguous and Inter-band CA, or 4DL with Intra-band non-contiguous and Intra-band contiguous CA, or 4DL with Intra-band non-contiguous and Intra-band non-contiguous CA.

9.1.46.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.46.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports
- Conditions defined in 36.101[2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP_{|dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.46.3-1: RSRP FDD Intra frequency absolute accuracy

<table>
<tr><th colspan="2">Accuracy</th><th colspan="5">Conditions</th></tr>
<tr><th rowspan="2">Normal condition</th><th rowspan="2">Extreme condition</th><th rowspan="2">Ês/Iot</th><th colspan="4">Io Note 1 range</th></tr>
<tr><th>E-UTRA operating band groups Note 3</th><th colspan="2">Minimum Io</th><th>Maximum Io</th></tr>
<tr><th>dB</th><th>dB</th><th>dB</th><th></th><th>dBm/15kHz Note 2</th><th>dBm/BWChannel</th><th>dBm/BWChannel</th></tr>
<tr><td rowspan="9">±4.5</td><td rowspan="9">±9</td><td rowspan="9">≥-6 dB</td><td>FDD_A, TDD_A</td><td>-121</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_B</td><td>-120.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_C, TDD_C</td><td>-120</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_D</td><td>-119.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_E, TDD_E</td><td>-119</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_F</td><td>-118.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_G</td><td>-118</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_H</td><td>-117.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_N</td><td>-114.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>±8</td><td>±11</td><td>≥-6 dB</td><td>FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N</td><td>N/A</td><td>-70</td><td>-50</td></tr>
<tr><td colspan="7">NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.</td></tr>
</table>

The FDD RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.46.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2_{|dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.46.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The requirements in Table 9.1.46.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.46.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.46.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.46.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.46.

9.1.46.4 Test description

9.1.46.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table TBD and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.46.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure TBD as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.46.4.3.

4. Cell 1 is PCell on channel 1, and Cell 2, Cell 4 and Cell 6 are activated SCells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 3, Cell 5 and Cell 7 are neighbouring cells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 shall be powered OFF.

9.1.46.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 4 and Cell6) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.46.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 9.1.46.5-1, 9.1.46.5-2 and 9.1.46.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4 and Cell 6 are compared to the actual RSRP values according to Table 9.1.46.5-4. These count respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell

4” and Cell 6. If the UE fails to report the measurement value for Cell 2, Cell 4 or Cell 6, the number of failed iterations for the respective event is increased by one.

The reported RSRP values for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.46.5-5. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 2-3”, “Cell 4-5” and “Cell 6-7”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 or Cell 7, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table TBD according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 2-3”, “Cell 4-5”, and “Cell 6-7” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.46.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.46.4.3-1: Common Exception messages for FDD RSRP Accuracy E-UTRA for Carrier Aggregation test requirement (TBD)

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.46.5 Test requirement

Tables 9.1.46.5-1, 9.1.46.5-2 and 9.1.46.5-3 define the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.46.5-4.

The RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.46.5-5.

Table 9.1.46.5-1: 4 DL FDD RSRP carrier aggregation test parameters for cell 1, cell 2 and cell 3

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15kHz	-117+TT	(N_{oc} for Channel 1 +1dB) +TT	
	Bands FDD_B		-116.5+TT		
	Bands FDD_C		-116+TT		
	Bands FDD_D		-115.5+TT		
	Bands FDD_E, FDD_F Note 6		-115+TT		
	Bands FDD_G		-114+TT		
	Bands FDD_H		-113.5+TT		
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	-4+TT	0.46+TT	-5.76+TT
RSRP Note3	Bands FDD_A	dBm/15kHz	-121+TT	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT
	Bands FDD_B		-120.5+TT		
	Bands FDD_C		-120+TT		
	Bands FDD_D		-119.5+TT		
	Bands FDD_E, FDD_F Note 6		-119+TT		
	Bands FDD_G		-118+TT		
	Bands FDD_H		-117.5+TT		
Io Note3	Bands FDD_A	dBm/$BW_{channel}$	-87.76 +10log($N_{RB,c}$/50) +TT	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$)) +TT	
	Bands FDD_B		-87.26 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_D		-86.26		

			+10log($N_{RB,c}$/50) +TT		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50) +TT		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	3
Time alignment error relative to cell 1 Note 7			-	≤ TAE	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.46.5-2: 4 DL FDD RSRP carrier aggregation test parameters for cell 4 and cell 5

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15kHz	(N_{oc} for Channel 1 +1dB) +TT	
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT
RSRP Note3	Bands FDD_A	dBm/15kHz	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$)) +TT	
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2

Timing offset to Cell 1	μs	0	3
Time alignment error relative to cell 1 Note 7		≤ TAE	-
Time alignment error relative to cell 2 Note 7		≤ TAE	-
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 8: E-UTRA operating band groups are as defined in Section 3.5.			

Table 9.1.46.5-3: 4 DL FDD RSRP carrier aggregation test parameters for cell 6 and cell 7

Parameter		Unit	Cell 6	Cell 7
E-UTRA RF Channel Number			4	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0
N_{oc} Note2	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(N_{oc} for Channel 1 +1dB) +TT	
$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT
RSRP Note3	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT
Io Note3	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/ $BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$)) +TT	
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2

Timing offset to Cell 1	μs	0	3
Time alignment error relative to cell 1Note 7		≤ TAE	-
Time alignment error relative to cell 2Note 7		≤ TAE	-
Time alignment error relative to cell 4Note 7		≤ TAE	-
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 8: E-UTRA operating band groups are as defined in Section 3.5.			

Table 9.1.46.5-4: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.								

Table 9.1.46.5-5: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 + [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 + [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 + [TBD]
Highest reported value (Cell 7)		RSRP_Cell 6 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.47 4DL TDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

- Annex E needs to be updated

- The test applicability needs to be added to TS36.521-2

9.1.47.1 Test purpose

To verify the TDD RSRP absolute and relative accuracy requirements in carrier aggregation are within the specified limits. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.47.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL Intra-band contiguous CA or 4DL Inter-band CA, or 4DL Intra-band contiguous with Inter-band CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 4DL Intra-band non-contiguous with Inter-band CA, or 4DL Intra-band non-contiguous with Intra-band contiguous CA.

9.1.47.3 Minimum conformance requirements

The TDD RSRP measurements of cells on the primary component carrier shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The TDD RSRP measurements of cells on the secondary component carrier 1 and 2 shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.47.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.47.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.4, and A.9.1.47.

The TDD RSRP relative measurements of cells on SCCs shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.2.2.

The accuracy requirements in Table 9.1.47.3-2 for SCCs relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.47.3-2: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The TDD RSRP relative measurements of cells on PCC and SCC shall meet relative accuracy requirements defined in TS 36.133 clause 9.1.3.2. The accuracy requirements in Table 9.1.47.3-3 for PCC-SCC relative accuracy requirements are valid under the following conditions:r

Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27 dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.47.3-3: RSRP relative accuracy for PCC and SCC

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.2, clause 9.1.4, and A.9.1.47.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.47.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.47.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.4, and A.9.1.47.

9.1.47.4 Test description

9.1.47.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table **TBD** and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.47.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure **TBD** as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.47.4.3.
4. Cell 1 is PCell on the primary component carrier, and cell 2, cell 4 and cell 6 are activated SCells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 3, cell 5 and cell 7 are neighbouring cells on secondary component carriers SCC1, SCC2 and SCC3 respectively. Cell 1 is used for connection setup with the power level set according to Annex C.0 and C.1. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 and Cell 7 shall be powered OFF.

9.1.47.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC 1, SCC 2 and SCC 3 according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure SCell 1 (Cell 2) , SCell 2 (Cell 4) and SCell 3 (Cell 6) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.47.4.3].
4. The SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.1.47.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP values for Cell 1, Cell 2, Cell 4 and Cell 6 are compared to the actual RSRP values according to Table 9.1.47.5-4. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” , “Cell 4” and “Cell 6”.. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 4, Cell 6 the number of failed iterations for the respective event is increased by one.

   The reported RSRP value for Cell 2, Cell 3, Cell 4, Cell 5 ,Cell 6 and Cell 7 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.47.5-5. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-4”, “Cell 1-6”, “Cell 2-3”, “Cell 4-5”, and “Cell 6-7”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6 or Cell 7, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table **TBD** according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events “Cell 1”, “Cell 2”, “Cell 4”, “Cell 6”, “Cell 1-2”, “Cell 1-4”, “Cell 1-6” “Cell 2-3”, “Cell 4-5” and “Cell 6-7” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCell scenario), the test passes. If one event fails, the test fails.

9.1.47.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.47.4.3-1: Common Exception messages for TDD RSRP Accuracy for E-UTRA Carrier Aggregation test requirement (TBD)

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.47.5 Test requirement

Table 9.1.47.5-1, 9.1.47.5-2 and 9.1.47.5-3 define the primary level settings including test tolerances for all tests.

The RSRP TDD absolute accuracy test shall meet the reported values test requirements in table 9.1.47.5-4.

The RSRP TDD relative accuracy test shall meet the reported values test requirements in table 9.1.47.5-5.

Table 9.1.47.5-1: 4 DL TDD RSRP carrier aggregation test parameters for cell 1, cell 2 and cell 3

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td colspan="2">2</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td></td><td>5MHz: $N_{RB,c}$ = 25
10MHz: $N_{RB,c}$ = 50
20MHz: $N_{RB,c}$ = 100</td><td colspan="2">5MHz: $N_{RB,c}$ = 25
10MHz: $N_{RB,c}$ = 50
20MHz: $N_{RB,c}$ = 100</td></tr>
<tr><td colspan="2">Special subframe configuration Note1</td><td></td><td colspan="3">6</td></tr>
<tr><td colspan="2">Uplink/downlink configuration Note1</td><td></td><td colspan="3">1</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>5MHz: 10-15
10MHz: 22-27
20MHz: 47-52</td><td colspan="2">5MHz: 10-15
10MHz: 22-27
20MHz: 47-52</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.3.1.1.2</td><td></td><td>5MHz: R.4 TDD
10MHz: R.0 TDD
20MHz: R.3 TDD</td><td>5MHz: R.4 TDD
10MHz: R.0 TDD
20MHz: R.3 TDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>5MHz: 7-17
10MHz: 13-36
20MHz: 38-61</td><td>5MHz: 7-17
10MHz: 13-36
20MHz: 38-61</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2</td><td></td><td>5MHz: R.11 TDD
10MHz: R.6 TDD
20MHz: R.10 TDD</td><td>5MHz: R.11 TDD
10MHz: R.6 TDD
20MHz: R.10 TDD</td><td>5MHz: R.11 TDD
10MHz: R.6 TDD
20MHz: R.10 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in A.3.2.2</td><td></td><td>5MHz: OP.9 TDD
10MHz: OP.1 TDD
20MHz: OP.7 TDD</td><td>5MHz: OP.9 TDD
10MHz: OP.1 TDD
20MHz: OP.7 TDD</td><td>5MHz: OP.10 TDD
10MHz: OP.2 TDD
20MHz: OP.8 TDD</td></tr>
<tr><td colspan="2">PBCH_RA</td><td rowspan="13">dB</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td colspan="2">PBCH_RB</td></tr>
<tr><td colspan="2">PSS_RA</td></tr>
<tr><td colspan="2">SSS_RA</td></tr>
<tr><td colspan="2">PCFICH_RB</td></tr>
<tr><td colspan="2">PHICH_RA</td></tr>
<tr><td colspan="2">PHICH_RB</td></tr>
<tr><td colspan="2">PDCCH_RA</td></tr>
<tr><td colspan="2">PDCCH_RB</td></tr>
<tr><td colspan="2">PDSCH_RA</td></tr>
<tr><td colspan="2">PDSCH_RB</td></tr>
<tr><td colspan="2">OCNG_RA Note2</td></tr>
<tr><td colspan="2">OCNG_RB Note2</td></tr>
<tr><td rowspan="3">N_{oc} Note3</td><td>Bands TDD_A</td><td rowspan="3">dBm/15kHz</td><td>-117</td><td colspan="2" rowspan="3">(N_{oc} for Channel 1 +1dB))+TT</td></tr>
<tr><td>Bands TDD_C</td><td>-116</td></tr>
<tr><td>Bands TDD_E</td><td>-115</td></tr>
<tr><td colspan="2">$\hat{E}_s/N_{oc}$</td><td>dB</td><td>-4</td><td>3+TT</td><td>-1+TT</td></tr>
<tr><td colspan="2">$\hat{E}_s/I_{ot}$</td><td>dB</td><td>-4</td><td>0.46+TT</td><td>-5.76+TT</td></tr>
<tr><td rowspan="3">RSRP Note4</td><td>Bands TDD_A</td><td rowspan="3">dBm/15kHz</td><td>-121</td><td rowspan="3">(RSRP for Cell 1 +8dB)+TT</td><td rowspan="3">(RSRP for Cell 1 +4dB)+TT</td></tr>
<tr><td>Bands TDD_C</td><td>-120</td></tr>
<tr><td>Bands TDD_E</td><td>-119</td></tr>
<tr><td rowspan="3">Io Note4</td><td>Bands TDD_A</td><td rowspan="3">dBm/$BW_{channel}$</td><td>-87.76 + 10log($N_{RB,c}$/50)</td><td colspan="2" rowspan="3">(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))+TT</td></tr>
<tr><td>Bands TDD_C</td><td>-86.76 + 10log($N_{RB,c}$/50)</td></tr>
<tr><td>Bands TDD_E</td><td>-85.76 + 10log($N_{RB,c}$/50)</td></tr>
<tr><td colspan="2">Propagation Condition</td><td></td><td>AWGN</td><td>AWGN</td><td>AWGN</td></tr>
<tr><td colspan="2">Antenna Configuration</td><td></td><td>1x2</td><td>1x2</td><td>1x2</td></tr>
<tr><td colspan="2">Timing offset to Cell 1</td><td>µs</td><td>-</td><td>0</td><td>3</td></tr>
<tr><td colspan="2">Time alignment error relative to cell 1 Note 7</td><td></td><td>-</td><td>≤ TAE</td><td>-</td></tr>
<tr><td colspan="6">Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.</td></tr>
</table>

Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.47.5-2: 4 DL TDD RSRP carrier aggregation test parameters for cell 4 and cell 5

Parameter		Unit	Cell 4	Cell 5
E-UTRA RF Channel Number			3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			6	
Uplink/downlink configuration[Note1]			1	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0
N_{oc} [Note3]	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15kHz	(N_{oc} for Channel 1 +1dB)+TT	
$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT
RSRP[Note4]	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15kHz	(RSRP for Cell 1 +8dB)+TT	(RSRP for Cell 1 +4dB)+TT
Io[Note4]	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/$BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))+TT	
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		µs	0	3
Time alignment error relative to cell 1 [Note 7]			≤ TAE	-
Time alignment error relative to cell 2 [Note 7]			≤ TAE	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.47.5-3: 4 DL TDD RSRP carrier aggregation test parameters for cell 6 and cell 7

Parameter		Unit	Cell 6	Cell 7
E-UTRA RF Channel Number			4	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			6	
Uplink/downlink configuration[Note1]			1	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0
N_{oc} [Note3]	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15kHz	(N_{oc} for Channel 1 +1dB) +TT	
$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT
RSRP[Note4]	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/15kHz	(RSRP for Cell 1 +8dB)+TT	(RSRP for Cell 1 +4dB)+TT
Io[Note4]	Bands TDD_A Bands TDD_C Bands TDD_E	dBm/$BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))+TT	
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	0	3
Time alignment error relative to cell 1 [Note 7]			≤ TAE	-
Time alignment error relative to cell 2 [Note 7]			≤ TAE	
Time alignment error relative to cell 4 [Note 7]			≤ TAE	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.				

Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.47.5-4: RSRP TDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4 and Cell 6, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4 or Cell 6.				

Table 9.1.47.5-5: RSRP TDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 – [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 – [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 – [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 – [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 6)	Cell 6-7	RSRP_Cell 6 – [TBD]
Highest reported value (Cell 6)		RSRP_Cell 6 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.48 5 DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.1.48.1 Test purpose

To verify that TDD-FDD RSRP absolute and relative measurement accuracy in carrier aggregation with PCell in FDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.48.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 5DL CA with FDD as PCell.

9.1.48.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The absolute accuracy requirements in table 9.1.48.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.48.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

The RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.48.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.48.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW_{Channel}
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.48.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.48.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW_{Channel}
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.48.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.48.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.48.

9.1.48.4 Test description

9.1.48.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.48.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure [TBD] as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.48.4.3.
4. Cell 1 is PCell on the primary component carrier, and Cell 2, Cell 4, Cell6, and Cell 8 are activated SCells on secondary component carriers SCC1, SCC2, SCC3 and SCC4 respectively. Cell 3, Cell 5, Cell7 and Cell 9 are neighbouring cells on secondary component carriers SCC1, SCC2, SCC3 and SCC4 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell7, Cell8, and Cell 9 shall be powered OFF.

9.1.48.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 4, Cell6, and Cell 8) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.48.4.3].
4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.1.48.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4, Cell 6, and Cell 8 are compared to the actual RSRP values according to Table 9.1.48.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell

4", "Cell 6", and "Cell 8". If the UE fails to report the measurement value for Cell 2 or Cell 4 or Cell 6 or Cell 8, the number of failed iterations for the respective event is increased by one.

The reported RSRP value for Cell 2, Cell 3, Cell 4, Cell5, Cell 6, Cell 7, Cell 8, and Cell 9 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.48.5-3. These count respectively as a Pass or Fail for the events "Cell 1-2", "Cell 1-4", "Cell 1-6", "Cell 1-8", "Cell 2-3", "Cell 4-5", "Cell 6-7", and "Cell 8-9". If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell6, Cell 7, Cell 8, or Cell 9, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1", "Cell 2", "Cell 4", "Cell 6", "Cell 8", "Cell 1-2", "Cell 1-4", "Cell 1-6", "Cell 1-8", "Cell 2-3", "Cell 4-5", "Cell 6-7", and "Cell 8-9" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.48.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.48.4.3-1: Common Exception messages for FDD RSRP Accuracy E-UTRA for Carrier Aggregation test requirement (TBD)

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.48.5 Test requirement

Table 9.1.48.5-1 and Table 9.1.48.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.48.5-3.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.48.5-4.

Table 9.1.48.5-1: 5DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation test parameters (Cell 1 - Cell 5)

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number			1	2		3	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			-	6		6	
Uplink/downlink configuration[Note1]			-	1		1	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1.			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2.			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.7 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0	0	0
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA[Note2]							
OCNG_RB[Note2]							
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT	
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-117+TT	-		-	

	Bands FDD_B		-116.5+TT				
	Bands FDD_C		-116+TT				
	Bands FDD_D		-115.5+TT				
	Bands FDD_E, FDD_F Note 7		-115+TT				
	Bands FDD_G		-114+TT				
	Bands FDD_H		-113.5+TT				
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	-4	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
RSRP Note4	Bands TDD_A	dBm/15 kHz	-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-121	-	-	-	-
	Bands FDD_B		-120.5				
	Bands FDD_C		-120				
	Bands FDD_D		-119.5				
	Bands FDD_E, FDD_F Note 7		-119				
	Bands FDD_G		-118				
	Bands FDD_H		-117.5				
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-87.76+10log($N_{RB,c}$/50)	-		-	
	Bands FDD_B		-87.26+10log($N_{RB,c}$/50)				
	Bands FDD_C		-86.76+10log($N_{RB,c}$/50)				
	Bands FDD_D		-86.26+10log($N_{RB,c}$/50)				
	Bands FDD_E, FDD_F Note 7		-85.76 +10log($N_{RB,c}$/50)				
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50)				
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50)				
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		μs	-	0	3	0	3
Time alignment error relative to cell 1 Note 8			-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2 Note 8			-	-	-	≤ TAE	-
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.							

Note 2:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.48.5-2: 5DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation test parameters (Cell 6 - Cell 9)

Parameter		Unit	Cell 6	Cell 7	Cell 8	Cell 9
E-UTRA RF Channel Number			4		5	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]			6		6	
Uplink/downlink configuration[Note1]			1		1	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	N/A
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	N/A	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.10 TDD 10MHz: OP.2 TDD 20MHz: OP.8 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA[Note2]						
OCNG_RB[Note2]						
N_{oc} [Note3]	Bands TDD_A	dBm/15kHz	(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT	
	Bands TDD_C					
	Bands TDD_E					
$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
RSRP[Note4]	Bands TDD_A	dBm/15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
	Bands TDD_C					
	Bands TDD_E					
Io[Note4]	Bands TDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands TDD_C					
	Bands TDD_E					
Propagation Condition			AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2
Timing offset to Cell 1		μs	0	3	0	3
Time alignment error relative to cell 1 [Note 7]			≤ TAE	-	≤ TAE	-

Time alignment error relative to cell 2 Note 7		≤ TAE		≤ TAE	
Time alignment error relative to cell 4 Note 7		≤ TAE		≤ TAE	
Time alignment error relative to cell 6 Note 7				≤ TAE	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.48.5-3: 5DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 8)	Cell 8	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 8)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 8)	Cell 8	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 8)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4, Cell 6 and Cell 8, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4, Cell 6, or Cell 8.								

Table 9.1.48.5-4: 5DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 8)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 8)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 + [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 + [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 + [TBD]
Highest reported value (Cell 7)		RSRP_Cell 6 + [TBD]
Lowest reported value (Cell 9)	Cell 8-9	RSRP_Cell 8 + [TBD]
Highest reported value (Cell 9)		RSRP_Cell 8 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.49 5 DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.1.49.1 Test purpose

To verify that TDD-FDD RSRP absolute and relative measurement accuracy in carrier aggregation with PCell in TDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.49.2 Test applicability

This test applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 5DL CA with TDD as PCell.

9.1.49.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.48.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.49.

9.1.49.4 Test description

9.1.49.4.1 Initial conditions

Same initial conditions as in clause 9.1.48.4.1 with the following exceptions:

- Message contents are defined in clause 9.1.49.4.3.

9.1.49.4.2 Test procedure

Same test procedure as in clause 9.1.48.4.2 with the following exceptions:

- Instead of Table 9.1.48.5-1 → use Table 9.1.49.5-1.
- Instead of Table 9.1.48.5-2 → use Table 9.1.49.5-2.
- Instead of Table 9.1.48.5-3 → use Table 9.1.49.5-3.

9.1.49.4.3 Message contents

Same message contents as in clause 9.1.48.4.3.

9.1.49.5 Test requirement

Table 9.1.49.5-1 and Table 9.1.49.5-2 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.49.5-3.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.49.5-4.

Table 9.1.49.5-1: 5DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation test parameters (Cell 1 - Cell 5)

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5
E-UTRA RF Channel Number		1	2		3	
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Special subframe configuration[Note1]		6	-		-	
Uplink/downlink configuration[Note1]		1	-		-	
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1.		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2.		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]	dB	0	0	0	0	0
N_{oc} Note3 — Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E,	dBm/15 kHz	-	(N_{oc} for Channel 1 +1dB)+TT		(N_{oc} for Channel 1 +1dB) +TT	

	FDD_F Note 7						
	Bands FDD_G						
	Bands FDD_H						
	Bands TDD_A		-117+TT				
	Bands TDD_C		-116+TT	-		-	
	Bands TDD_E		-115+TT				
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	-4+TT	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
	Bands FDD_A						
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D		-	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)
RSRP Note4	Bands FDD_E, FDD_F Note 7	dBm/15 kHz					
	Bands FDD_G						
	Bands FDD_H						
	Bands TDD_A		-121				
	Bands TDD_C		-120	-	-	-	-
	Bands TDD_E		-119				
	Bands FDD_A						
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D		-	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_E, FDD_F Note 7						
Io Note4	Bands FDD_G	dBm/ $BW_{channel}$					
	Bands FDD_H						
	Bands TDD_A		-87.76+10log($N_{RB,c}$/50)				
	Bands TDD_C		-86.76+10log($N_{RB,c}$/50)	-		-	
	Bands TDD_E		-85.76+10log($N_{RB,c}$/50)				
Propagation condition		-	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2	1x2	1x2
Timing offset to cell 1		µs	-	0	3	0	3
Time alignment error relative to cell 1 Note 8			-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2 Note8			-	-	-	≤ TAE	-

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 9:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.49.5-2: 5DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation test parameters (Cell 6 - Cell 9)

Parameter		Unit	Cell 6	Cell 7	Cell 8	Cell 9
E-UTRA RF Channel Number			4		5	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.3.1.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0
N_{oc} Note2	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(N_{oc} for Channel 1 +1dB)+TT		(N_{oc} for Channel 1 +1dB) +TT	
$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
RSRP Note3	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)	(RSRP for Cell 1 +8dB)	(RSRP for Cell 1 +4dB)

Io[Note3]	Bands FDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel\ 1}$))	
	Bands FDD_B					
	Bands FDD_C					
	Bands FDD_D					
	Bands FDD_E, FDD_F [Note 6]					
	Bands FDD_G					
	Bands FDD_H					
Propagation Condition			AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2
Timing offset to Cell 1		µs	0	3	0	3
Time alignment error relative to cell 1[Note 7]			≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2[Note 7]			≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 4[Note 7]			≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 6[Note 7]					≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.49.5-3: 5DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands TDD_A	Bands TDD_C	Bands TDD_E
Normal Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 8)	Cell 8	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 8)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions				
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 8)	Cell 8	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 8)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4, Cell 6, and Cell 8, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4, Cell 6, or Cell 8.				

Table 9.1.49.5-4: 5DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 8)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 8)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 + [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 + [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 + [TBD]
Highest reported value (Cell 7)		RSRP_Cell 6 + [TBD]
Lowest reported value (Cell 9)	Cell 8-9	RSRP_Cell 8 + [TBD]
Highest reported value (Cell 9)		RSRP_Cell 8 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.50 5DL FDD RSRP for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test uncertainties and test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

- Annex E needs to be updated

- The test applicability needs to be added to TS36.521-2

9.1.50.1 Test purpose

To verify that FDD absolute and relative RSRP measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRP accuracy requirements of the primary component carrier, the absolute RSRP accuracy requirements of the secondary component carriers, and the relative RSRP accuracy requirements of the secondary component carriers. The test will also verify the primary and secondary component carriers' relative RSRP accuracy requirement.

9.1.50.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support 5DL with Intra-band contiguous and Inter-band CA or 5DL with Intra-band non-contiguous and Inter-band CA or 5DL with Intra-band non-contiguous and Intra-band contiguous CA.

This test case also applies to all types of E-UTRA FDD UE release 12 and forward that support 5DL Inter-band CA.

9.1.50.3 Minimum conformance requirements

The RSRP measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1. The FDD RSRP measurements of cells on the secondary component carriers shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.2.1.

The accuracy requirements in table 9.1.50.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports
- Conditions defined in 36.101[2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP_{|dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.1.50.3-1: RSRP FDD Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD B, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The FDD RSRP relative measurements of cells on the PCC compared with measurements of cells on any of the SCCs shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.3.2. The RSRP relative measurements of cells on any SCC shall meet relative accuracy requirements defined in TS 36.133 [4] clause 9.1.2.2.

The accuracy requirements in Table 9.1.50.3-2 for PCC-SCC relative accuracy requirements are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.50.3-2: RSRP PCC-SCC relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±4.5	±6	≥-6 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The requirements in Table 9.1.50.3-3 for SCC relative accuracy are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

Table 9.1.50.3-3: RSRP relative accuracy for SCCs

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±2	±3	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3	±3	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.50.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.50.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.4, and A.9.1.50.

9.1.50.4 Test description

9.1.50.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table TBD and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.1.50.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure TBD as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.50.4.3.

4. Cell 1 is PCell on channel 1, and Cell 2, Cell 4, Cell 6 and Cell 8 are activated SCells on secondary component carriers SCC1, SCC2, SCC3 and SCC4 respectively. Cell 3, Cell 5, Cell 7 and Cell 9 are neighbouring cells on secondary component carriers SCC1, SCC2, SCC3 and SCC4 respectively. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7, Cell 8 and Cell 9 shall be powered OFF.

9.1.50.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2, Cell 4, Cell6 and Cell8) on the SCCs as per TS 36.508 [7] clause 5.2A.4 [with the message content exceptions defined in clause 9.1.50.4.3].

4. SS activates SCCs by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Tables 9.1.50.5-1 and 9.1.50.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRP values for Cell 1, Cell 2, Cell 4, Cell 6 and Cell 8 are compared to the actual RSRP values according to Table 9.1.50.5-3. These count respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell

4", "Cell 6" and "Cell 8". If the UE fails to report the measurement value for Cell 2, Cell 4, Cell6 or Cell 8, the number of failed iterations for the respective event is increased by one.

The reported RSRP values for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7, Cell 8 and Cell 9 are compared to the reported RSRP value of other cells for each MeasurementReport message according to Table 9.1.50.5-4. These count respectively as a Pass or Fail for the events "Cell 1-2", "Cell 1-4", "Cell 1-6", "Cell 1-8", "Cell 2-3", "Cell 4-5", "Cell 6-7" and "Cell 8-9". If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, Cell 5, Cell 6, Cell 7, Cell 8, Cell 9, the number of failed iterations for the respective event is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for all relevant PCell/SCells scenarios defined in Table TBD according to the UE declared capability for UL support (within CA operation) in the individual bands.

Each of the events "Cell 1", "Cell 2", "Cell 4", "Cell 6", "Cell 8" "Cell 1-2", "Cell 1-4", "Cell 1-6", "Cell 1-8", "Cell 2-3", "Cell 4-5", "Cell 6-7" and "Cell 8-9" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration (without and with switched PCell/SCells scenario), the test passes. If one event fails, the test fails.

9.1.50.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.50.4.3-1: Common Exception messages for FDD RSRP Accuracy E-UTRA for Carrier Aggregation test requirement

TBD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-7 Table H.4.2-5

9.1.50.5 Test requirement

Tables 9.1.50.5-1 and 9.1.50.5-2 define the primary level settings including test tolerances for all tests.

The RSRP FDD absolute accuracy test shall meet the reported values test requirements in table 9.1.50.5-3.

The RSRP FDD relative accuracy test shall meet the reported values test requirements in table 9.1.50.5-4.

Table 9.1.50.5-1: 5 DL FDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #1, cell #2 and cell #3)

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15kHz	-117+TT	(N_{oc} for Channel 1 +1dB) +TT	
	Bands FDD_B		-116.5+TT		
	Bands FDD_C		-116+TT		
	Bands FDD_D		-115.5+TT		
	Bands FDD_E, FDD_F Note 6		-115+TT		
	Bands FDD_G		-114+TT		
	Bands FDD_H		-113.5+TT		
$\hat{E}_s/N_{oc}$		dB	-4+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	-4+TT	0.46+TT	-5.76+TT
RSRP Note3	Bands FDD_A	dBm/15kHz	-121+TT	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT
	Bands FDD_B		-120.5+TT		
	Bands FDD_C		-120+TT		
	Bands FDD_D		-119.5+TT		
	Bands FDD_E, FDD_F Note 6		-119+TT		
	Bands FDD_G		-118+TT		
	Bands FDD_H		-117.5+TT		
Io Note3	Bands FDD_A	dBm/ $BW_{channel}$	-87.76 +10log($N_{RB,c}$/50) +TT	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$)) +TT	
	Bands FDD_B		-87.26 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_C		-86.76 +10log($N_{RB,c}$/50) +TT		

	Bands FDD_D		-86.26 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_E, FDD_F Note 6		-85.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50) +TT		
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	3
Time alignment error relative to cell 1 Note 7			-	≤ TAE	-
Time alignment error relative to cell 2 Note 7			-	-	-
Time alignment error relative to cell 4 Note 7			-	-	-
Time alignment error relative to cell 6 Note 7			-	-	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.50.5-2: 5 DL FDD RSRP test parameters for E-UTRAN Carrier aggregation (cell #4 – cell #9)

Parameter		Unit	Cell 4	Cell 5	Cell 6	Cell 7	Cell 8	Cell 9
E-UTRA RF Channel Number			3		4		5	
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100		5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52		5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	
PDSCH Reference measurement channel defined in A.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	-
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.16 FDD 10MHz: OP.2 FDD 20MHz: OP.12 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A Bands FDD_B Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dBm/15kHz	(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT		(N_{oc} for Channel 1 +1dB) +TT	

$\hat{E}_s/N_{oc}$		dB	3+TT	-1+TT	3+TT	-1+TT	3+TT	-1+TT
$\hat{E}_s/I_{ot}$		dB	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT	0.46+TT	-5.76+TT
RSRP Note3	Bands FDD_A	dBm/15kHz	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT	(RSRP for Cell 1 +8dB) +TT	(RSRP for Cell 1 +4dB) +TT
	Bands FDD_B							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 6							
	Bands FDD_G							
	Bands FDD_H							
Io Note3	Bands FDD_A	dBm/ $BW_{channel}$	(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel3}$ / $N_{RB\ channel1}$)) +TT		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel4}$ / $N_{RB\ channel1}$)) +TT		(Io for Channel 1 +5.33dB +10log ($N_{RB\ channel5}$ / $N_{RB\ channel1}$)) +TT	
	Bands FDD_B							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 6							
	Bands FDD_G							
	Bands FDD_H							
Propagation Condition			AWGN	AWGN	AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2	1x2	1x2
Timing offset to Cell 1		μs	0	3	0	3	0	3
Time alignment error relative to cell 1 Note 7			≤ TAE	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 2 Note 7			≤ TAE	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 4 Note 7			-	-	≤ TAE	-	≤ TAE	-
Time alignment error relative to cell 6 Note 7			-	-		-	≤ TAE	-

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.50.5-3: RSRP FDD Carrier Aggregation absolute accuracy requirements for the reported values

Band of Cell 1 on Primary Component Carrier	Event	Bands FDD_A	Bands FDD_B	Bands FDD_C	Bands FDD_D	Bands FDD_E, FDD_F	Bands FDD_G	Bands FDD_H
Normal Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 8	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Extreme Conditions								
Lowest reported value (Cell 1)	Cell 1	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 1)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 2)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 4)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 6)	Cell 6	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 6)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Lowest reported value (Cell 8)	Cell 8	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Highest reported value (Cell 8)		RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]	RSRP_[TBD]
Note: The band of Cell 1 determines the levels for Cell 1, Cell 2, Cell 4, Cell 6 and Cell 8, so the reported RSRP values depend only on the band of Cell 1, and are not dependent on the band of Cell 2, Cell 4, Cell 6 or Cell 8.								

Table 9.1.50.5-4: RSRP FDD Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 8)		RSRP_Cell 1 + [TBD]
Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 2)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 4)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 6)	Cell 1-6	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 6)		RSRP_Cell 1 + [TBD]
Lowest reported value (Cell 8)	Cell 1-8	RSRP_Cell 1 + [TBD]
Highest reported value (Cell 8)		RSRP_Cell 1 + [TBD]
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 3)	Cell 2-3	RSRP_Cell 2 + [TBD]
Highest reported value (Cell 3)		RSRP_Cell 2 + [TBD]
Lowest reported value (Cell 5)	Cell 4-5	RSRP_Cell 4 + [TBD]
Highest reported value (Cell 5)		RSRP_Cell 4 + [TBD]
Lowest reported value (Cell 7)	Cell 6-7	RSRP_Cell 6 + [TBD]
Highest reported value (Cell 7)		RSRP_Cell 6 + [TBD]
Lowest reported value (Cell 9)	Cell 8-9	RSRP_Cell 8 + [TBD]
Highest reported value (Cell 9)		RSRP_Cell 8 + [TBD]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.51

9.1.52 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA

9.1.52.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for FD-FDD intra frequency RSRP measurements for Cat-M1 UE in CEModeA.

9.1.52.2 Test applicability

This test applies to all types of E-UTRA FD-FDD UE release 13 and forward of UE category M1 that support CE Mode A. Applicability requires support for FGI bit 16.

9.1.52.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category M1.

The accuracy requirements in Table 9.1.52.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.52.3-1: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode A

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BWChannel	dBm/BWChannel
±7	±10	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_N	-114.5	N/A	-70
±9	±12	≥-6 dB	FDD_A, TDD_A, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category M1 UE.

The accuracy requirements in Table 9.1.52.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2|dBm according to Annex I.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.52.3-2: RSRP Intra frequency relative accuracy for UE category M1 with CE mode A

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BWChannel
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.52.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.52.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.1, 9.1.21.2, 9.1.4 and A.9.1.52.

9.1.52.4 Test description

9.1.52.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E Table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.20 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B.0.

3. Message contents are defined in clause 9.1.52.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.52.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF-CE with the condition CEModeA according to TS 36.508 [7] clause 7.2A.3AA.

2. Set the parameters according to Table 9.1.52.5-1 as appropriate. Propagation conditions are set according to Annex B.1.

3. The SS shall transmit the RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit the RRCConnectionReconfigurationComplete message.

5. The UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, the SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.52.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRP value of Cell 2 is compared to the reported RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.52.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.52.5-1 as appropriate.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.52.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeA and the following exceptions:

Table 9.1.52.4.3-1: Common Exception messages for FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1a with Gap Pattern Id = 0 Table H.3.5-3a

Table 9.1.52.4.3-2: *MeasResults*: Additional FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.52.4.3-3: *MeasResultListEUTRA*: Additional FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.52.5 Test requirement

Table 9.1.52.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.52.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.52.5-3.

Table 9.1.52.5-1: FD-FDD RSRP Intra frequency test parameters for Cat-M1 UE in CEModeA

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.20 FDD	-	R.20 FDD	-	R.20 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
MPDCCH Reference measurement channel			R.16 FDD		R.16 FDD		R.16 FDD	
OCNG Patterns			OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 4						-114	
	Bands FDD_G Note 6						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{\mathrm{E}}_s/\mathrm{I}_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F Note 4						-111	-114.2
	Bands FDD_G Note 6						-110	-113.2
	Bands FDD_H						-109.5	-112.7
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 4						-80.25	
	Bands FDD_G Note 6						-79.25	
	Bands FDD_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 5: E-UTRA operating band groups are as defined in Section 3.5. Note 6: Except Band 29 and Band 32.

Table 9.1.52.5-2: FD-FDD RSRP Intra frequency absolute accuracy requirements for the reported values for Cat-M1 UE in CEModeA

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD_A	RSRP_16
			Bands FDD_B	RSRP_16
			Bands FDD_C	RSRP_17
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_18
			Bands FDD_G	RSRP_19
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD_A	RSRP_33
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_34
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_35
			Bands FDD_G	RSRP_36
			Bands FDD_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.52.5-3: FD-FDD RSRP Intra frequency relative accuracy requirements for the reported values for Cat-M1 UE in CEModeA

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal and Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_Cell 1 - 10	RSRP_Cell 1 -10	RSRP_Cell 1 - 9
Highest reported value (Cell 2)	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.53 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA

9.1.53.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for HD-FDD intra frequency RSRP measurements for Cat-M1 UE in CEModeA.

9.1.53.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that support CE Mode A. Applicability requires support for FGI bit 16.

9.1.53.3 Minimum conformance requirements

Same minimum conformance requirements as in Clause 9.1.52.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.1, 9.1.21.2, 9.1.4 and A.9.1.53.

9.1.53.4 Test description

Same test description as in clause 9.1.52.4 with the following exceptions:

- Instead of Table 9.1.52.5-1 → use Table 9.1.53.5-1.
- Instead of Table 9.1.52.5-2 → use Table 9.1.53.5-2.
- Instead of Table 9.1.52.5-3 → use Table 9.1.53.5-3.

9.1.53.5 Test requirement

Table 9.1.53.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.53.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.53.5-3.

Table 9.1.53.5-1: HD-FDD RSRP Intra frequency test parameters for Cat-M1 UE in CEModeA

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.10 HD-FDD	-	R.10 HD-FDD	-	R.10 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
MPDCCH Reference measurement channel			R.6 HD-FDD		R.6 HD-FDD		R.6 HD-FDD	
OCNG Patterns			OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB MPDCCH_RA MPDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-107		-87		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands FDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands FDD_B						-112.5	-115.7
	Bands FDD_C						-112	-115.2
	Bands FDD_D						-111.5	-114.7
	Bands FDD_E, FDD_F Note 4						-111	-114.2
	Bands FDD_G Note 6						-110	-113.2
	Bands FDD_H						-109.5	-112.7
Io Note3	Bands FDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands FDD_B						-81.75	
	Bands FDD_C						-81.25	
	Bands FDD_D						-80.75	
	Bands FDD_E, FDD_F Note 4						-80.25	
	Bands FDD_G Note 6						-79.25	
	Bands FDD_H						-78.75	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel

	bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.53.5-2: HD-FDD RSRP Intra frequency absolute accuracy requirements for the reported values for Cat-M1 UE in CEModeA

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands FDD_A	RSRP_16
			Bands FDD_B	RSRP_16
			Bands FDD_C	RSRP_17
			Bands FDD_D	RSRP_17
			Bands FDD_E, FDD_F	RSRP_18
			Bands FDD_G	RSRP_19
			Bands FDD_H	RSRP_19
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands FDD_A	RSRP_33
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_34
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_35
			Bands FDD_G	RSRP_36
			Bands FDD_D	RSRP_36
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands FDD_A	RSRP_13
			Bands FDD_B	RSRP_13
			Bands FDD_C	RSRP_14
			Bands FDD_D	RSRP_14
			Bands FDD_E, FDD_F	RSRP_15
			Bands FDD_G	RSRP_16
			Bands FDD_H	RSRP_16
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands FDD_A	RSRP_36
			Bands FDD_B	RSRP_36
			Bands FDD_C	RSRP_37
			Bands FDD_D	RSRP_37
			Bands FDD_E, FDD_F	RSRP_38
			Bands FDD_G	RSRP_39
			Bands FDD_H	RSRP_39
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.53.5-3: HD-FDD RSRP Intra frequency relative accuracy requirements for the reported values for Cat-M1 UE in CEModeA

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal and Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_Cell 1 - 10	RSRP_Cell 1 -10	RSRP_Cell 1 - 9
Highest reported value (Cell 2)	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2	RSRP_Cell 1 + 2

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.54 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA

9.1.54.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for TDD intra frequency RSRP measurements for Cat-M1 UE in CEModeA.

9.1.54.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1 that support CE Mode A. Applicability requires support for FGI bit 16.

9.1.54.3 Minimum conformance requirements

Same minimum conformance requirements as in Clause 9.1.52.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.1, 9.1.21.2, 9.1.4 and A.9.1.54.

9.1.54.4 Test description

Same test description as in clause 9.1.52.4 with the following exceptions:

- Instead of Table 9.1.52.5-1 → use Table 9.1.54.5-1.
- Instead of Table 9.1.52.5-2 → use Table 9.1.54.5-2.
- Instead of Table 9.1.52.5-3 → use Table 9.1.54.5-3.

9.1.54.5 Test requirement

Table 9.1.54.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.54.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.54.5-3.

Table 9.1.54.5-1: TDD RSRP Intra frequency test parameters for Cat-M1 UE in CEModeA

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.16 TDD	-	R.16 TDD	-	R.16 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
MPDCCH Reference measurement channel			R.14 TDD		R.14 TDD		R.14 TDD	
OCNG Patterns			OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB MPDCCH_RA MPDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-107		-87		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.2
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-101	-105	-81	-85	-113	-116.2
	Bands TDD_C						-112	-115.2
	Bands TDD_E						-111	-114.2
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.05		-51.05		-82.25	
	Bands TDD_C						-81.25	
	Bands TDD_E						-80.25	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.54.5-2: TDD RSRP Intra frequency absolute accuracy requirements for the reported values for Cat-M1 UE in CEModeA

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_27	RSRP_45	Bands TDD_A	RSRP_16
			Bands TDD_C	RSRP_17
			Bands TDD_E	RSRP_18
Highest reported value (Cell 2)	RSRP_44	RSRP_66	Bands TDD_A	RSRP_33
			Bands TDD_C	RSRP_34
			Bands TDD_E	RSRP_35
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_24	RSRP_42	Bands TDD_A	RSRP_13
			Bands TDD_C	RSRP_14
			Bands TDD_E	RSRP_15
Highest reported value (Cell 2)	RSRP_47	RSRP_69	Bands TDD_A	RSRP_36
			Bands TDD_C	RSRP_37
			Bands TDD_E	RSRP_38
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.54.5-3: TDD RSRP Intra frequency relative accuracy requirements for the reported values for Cat-M1 UE in CEModeA

	Event	All bands
Normal and Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – [FFS]
Highest reported value (Cell 2)		RSRP_Cell 1 + [FFS]

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.55 FDD intra frequency absolute and relative RSRP accuracies for SCell with frame structure 3

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-Some of the Test requirements are in square brackets.

-Test tolerances would need an update.

-Annex F updates are pending

-Some of the test parameters are in square brackets.

9.1.55.1 Test purpose

To verify that FDD intra frequency RSRP absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRP accuracy requirement of the secondary component carrier and the relative RSRP accuracy requirement of the secondary component carriers. The test will also verify the primary and secondary component carrier relative RSRP accuracy requirement.

9.1.55.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward supporting downlink LAA.

7.3.55.3 Minimum conformance requirements

RSRP measurement of cells on secondary component carrier with frame structure 3 shall meet the intra frequency absolute accuracy requirements in TS36.133 [4] section 9.1.18.2.4.

The requirements for absolute accuracy of RSRP in this clause apply to a cell on a serving carrier frequency.

The accuracy requirements in Table 9.1.55.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.1 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.55.3-1: RSRP intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
[±4.5]	[±9]	≥-6 dB	FS3_G	-118	N/A	-70
[±8]	[±11]	≥-6 dB	FS3_G	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

Comparisons between RSRP of cells on the same secondary component carrier shall meet the intra-frequency relative accuracy requirements in TS36.133 [4] sections 9.1.18.2.5.

The accuracy requirements in Table 9.1.55.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex B.3.22.1 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.55.3-2: RSRP intra frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
[±2]	[±3]	≥-3 dB	FS3_G	-118	-50
[±3]	[±3]	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRP inter-frequency accuracy requirements in TS36.133 [4] sections 9.1.18.2.3.

The accuracy requirements in Table 9.1.55.3-3 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex B.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.1.55.3-3: RSRP inter-frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
[±4.5]	[±6]	≥-6 dB	FS3_G	-118	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.55.3-4. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.55.3-4: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.19.2, clause 9.1.19.3, clause 9.1.4 and A.9.1.55.

9.1.55.4 Test description

9.1.55.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20+20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.55.4.3.

4. Cell 1 is PCell on the primary component carrier, Cell 2 is SCell on the secondary component carrier and Cell 3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.55.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).
5. Set the parameters according to Table 9.1.55.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 3 is compared to actual RSRP value according to Table 9.1.55.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRP value for Cell 3 is compared to the reported RSRP value for Cell2 and Cell1 for each MeasurementReport message according to Table 9.1.55.5-3. This counts as a Pass or Fail for the events “Cell 2-3” and “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.
10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 2-3” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass for each configuration, the test passes. If one event fails, the test fails.

9.1.55.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.55.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-3 Table H.4.1-5 Table H.4.2-1

Table 9.1.55.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
	1		
}			
}			
}			
}			

9.1.55.5 Test requirement

Table 9.1.55.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.33.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.33.5-3.

Table 9.1.55.5-1: Test parameters for FDD RSRP accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	**Cell 2**	**Cell3**
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	[40]	[40]
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	[C.3.5]
Timing offset to cell1	µs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	[47-52]	[47-52]
PDSCH Reference measurement channel defined in A.3.1.1 and A.3.1.1.6(R.0 FS3)		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	[R.0 FS3]	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	[R.0 FS3]	[R.0 FS3]
OCNG Patterns defined in A.3.2		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	[TBD]	[TBD]
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA	dB	0	0	0

PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117	-	
	Bands FDD_B		-116.5		
	Bands FDD_C		-116		
	Bands FDD_D		-115.5		
	Bands FDD_E, FDD_F Note 6		-115		
	Bands FDD_G		-114		
	Bands FDD_H		-113.5		
	Bands FS3_G		-	[(N_{oc} for Channel 1 +1dB)]	
$\hat{E}_s/I_{ot}$		dB	[-4]	[0.46 Note9]	[-5.76]
RSRP Note3	Bands FDD_A	dBm/15 kHz	[-121]+TT	-	
	Bands FDD_B		[-120.5] +TT		
	Bands FDD_C		[-120] +TT		
	Bands FDD_D		[-119.5] +TT		
	Bands FDD_E, FDD_F Note 6		[-119] +TT		
	Bands FDD_G		[-118] +TT		
	Bands FDD_H		[-117.5] +TT		
	Bands FS3_G		-	[(RSRP for Cell 1 +8dB)]	[(RSRP for Cell 1 +4dB)]
Io Note3	Bands FDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	[-87.76 +10log($N_{RB,c}$/50)]	-	
	Bands FDD_B		[-86.26 +10log($N_{RB,c}$/50)]		
	Bands FDD_C		[-86.76 +10log($N_{RB,c}$/50)]		
	Bands FDD_D		[-86.26 +10log($N_{RB,c}$/50)]		
	Bands FDD_E, FDD_F Note 6		[-85.76 +10log($N_{RB,c}$/50)]		
	Bands FDD_G		[-84.76 +10log($N_{RB,c}$/50)]		
	Bands FDD_H		[-84.26 +10log($N_{RB,c}$/50)]		
	Bands FS3_G		-	[(Io for Channel 1 +5.33dB Note9 +10log($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))]	[(Io for Channel 1 +5.33dB +10log($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$))]
$\hat{E}_s/N_{oc}$		dB	[-4]	[3]	[-1]
Propagation condition		-	AWGN		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information

	purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.
Note 9:	The value is corresponding to DRS transmission through LBT operation in Cell3.

Table 9.1.55.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1						
Band of Cell 1 on Primary Component Carrier	**Bands FDD_A**	**Bands FDD_B**	**Bands FDD_C**	**Bands FDD_D**	**Bands FDD_E, FDD_F**	**Bands FDD_G**	**Bands FDD_H**
Normal Conditions							
Lowest reported value (Cell 3)	RSRP_17+ TT	RSRP_18+ TT	RSRP_18+ TT	RSRP_19+ TT	RSRP_19+ TT	RSRP_20+ TT	RSRP_21+ TT
Highest reported value (Cell 3)	RSRP_30+ TT	RSRP_30+ TT	RSRP_31+ TT	RSRP_31+ TT	RSRP_32+ TT	RSRP_33+ TT	RSRP_33+ TT
Extreme Conditions							
Lowest reported value (Cell 3)	RSRP_13+ TT	RSRP_13+ TT	RSRP_14+ TT	RSRP_14	RSRP_15+ TT	RSRP_16+ TT	RSRP_16+ TT
Highest reported value (Cell 3)	RSRP_34+ TT	RSRP_34+ TT	RSRP_35+ TT	RSRP_36+ TT	RSRP_36+ TT	RSRP_37+ TT	RSRP_38+ TT

Table 9.1.55.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 3)	RSRP_x -1+ TT
Highest reported value (Cell 3)	RSRP_x + 9+ TT
Lowest reported value (Cell 3)	RSRP_y - 5+ TT
Highest reported value (Cell 3)	RSRP_y + 1+ TT
Extreme Conditions	
Lowest reported value (Cell 3)	RSRP_x – 2+ TT
Highest reported value (Cell 3)	RSRP_x + 10+ TT
Lowest reported value (Cell 3)	RSRP_y – 6+ TT
Highest reported value (Cell 3)	RSRP_y + 2+ TT
RSRP_x is the reported value of Cell 1 RSRP_y is the reported value of Cell 2	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.56

9.1.57 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB

9.1.57.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements for FD-FDD intra-frequency RSRP measurements for Cat-M1 UE in CEModeB.

9.1.57.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 13 and forward of UE category M1. Applicability requires support for CE Mode B and FGI bit 16.

9.1.57.3 Minimum conformance requirements

The Intra-frequency absolute RSRP measurements for UE category M1 shall meet the absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.21.3. The Intra-frequency relative RSRP measurements for UE category M1 shall meet the relative accuracy requirements defined in TS 36.133 [4] clause 9.1.21.4.

The requirements for absolute accuracy of RSRP in this clause apply to a cell on the same frequency as that of the serving cell for UE category M1.

The accuracy requirements in Table 9.1.57.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.57.3-1: RSRP Intra-frequency absolute accuracy for UE category M1 with CE mode B for FDD and TDD

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±8	±11	-15≤Ês/Iot≤-12 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
±7	±10	≥-12 dB	FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_N	-114.5	N/A	-70
±10	±13	-15≤Ês/Iot≤-12 dB	FDD_A, TDD_A, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50
±9	±12	≥-12 dB				
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency for category M1 UE.

The accuracy requirements in Table 9.1.57.3-2 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$ according to Annex I.3.8 for a corresponding Band.

At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRP measurement assuming measured cell is identified cell.

Table 9.1.57.3-2: SRP Intra-frequency relative accuracy for UE category M1 with CE mode B for FDD and TDD

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±4	±4	≥-12 dB	FDD_A, TDD_A	-121	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_N	-114.5	-50
±5	±5	-15≤Ês/Iot≤-12 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.57.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.57.3-3: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.21.3, 9.1.21.4, 9.1.21.5, 9.1.4 and A.9.1.57.

9.1.57.4 Test description

9.1.57.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clauses B.0.

3. Message contents are defined in clause 9.1.57.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.57.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF-CE with the condition CEModeB according to TS 36.508 [7] clause 7.2A.3AA.
2. Set the parameters according to Table 9.1.57.5-1 as appropriate. Propagation conditions are set according to Annex B.1.
3. The SS shall transmit the RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit the RRCConnectionReconfigurationComplete message.
5. The UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, the SS shall check the reported RSRP values in periodical MeasurementReport messages.
   The reported RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.57.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRP value of Cell 2 is compared to the reported RSRP value of Cell 1 for each MeasurementReport message according to Table 9.1.57.5-3. This counts as a Pass or Fail for the event “Cell 1-2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.57.5-1 as appropriate.

Each of the events “Cell 2” and “Cell 1-2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.57.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the condition CEModeB and the following exceptions:

Table 9.1.57.4.3-1: Common Exception messages for FD-FDD RSRP Intra-frequency case for Cat-M1 UE in CEModeB test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1a with Gap Pattern Id = 0 Table H.3.5-3a

Table 9.1.57.4.3-2: *MeasResults*: Additional FD-FDD RSRP Intra-frequency case for Cat-M1 UE in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.57.4.3-3: *MeasResultListEUTRA*: Additional FD-FDD RSRP Intra-frequency case for Cat-M1 UE in CEModeB test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.57.5 Test requirement

Table 9.1.57.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.57.7-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.57.7-3.

Table 9.1.57.5-1: FD-FDD RSRP Intra-frequency test parameters for Cat-M1 UE in CEModeB

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.22 FDD	-	R.22 FDD	-	R.22 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
MPDCCH Reference measurement channel			R.18 FDD		R.18 FDD		R.18 FDD	
OCNG Patterns			OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB MPDCCH_RA MPDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-99.3		-79.3		-107	
	Bands FDD_B						-106.5	
	Bands FDD_C						-106	
	Bands FDD_D						-105.5	
	Bands FDD_E, FDD_F Note 4						-105	
	Bands FDD_G						-104	
	Bands FDD_H						-103.5	
$\hat{E}_s/N_{oc}$		dB	-12	-13.9	-12	-13.9	-12	-13.9
$\hat{E}_s/I_{ot}$		dB	-12.17	-14.17	-12.17	-14.17	-12.17	-14.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-111.3	-113.2	-91.3	-93.2	-119	-120.9
	Bands FDD_B						-118.5	-120.4
	Bands FDD_C						-118	-119.9
	Bands FDD_D						-117.5	-119.4
	Bands FDD_E, FDD_F Note 4						-117	-118.9
	Bands FDD_G						-116	-117.9
	Bands FDD_H						-115.5	-117.4
Io Note3	Bands FDD_A	dBm/9 MHz	-71.09		-51.09		-78.79	
	Bands FDD_B						-78.29	
	Bands FDD_C						-77.79	
	Bands FDD_D						-77.29	
	Bands FDD_E, FDD_F Note 4						-76.79	
	Bands FDD_G						-75.79	
	Bands FDD_H						-75.29	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.57.5-2: FD-FDD RSRP Intra-frequency absolute accuracy requirements for the reported values for Cat-M1 UE in CEModeB

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_18	RSRP_36	Bands FDD_A	RSRP_10
			Bands FDD_B	RSRP_11
			Bands FDD_C	RSRP_11
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_12
			Bands FDD_G	RSRP_13
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_37	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_B	RSRP_30
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_31
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_34
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_15	RSRP_33	Bands FDD_A	RSRP_7
			Bands FDD_B	RSRP_8
			Bands FDD_C	RSRP_8
			Bands FDD_D	RSRP_9
			Bands FDD_E, FDD_F	RSRP_9
			Bands FDD_G	RSRP_10
			Bands FDD_H	RSRP_11
Highest reported value (Cell 2)	RSRP_40	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_36
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.57.5-3: FD-FDD RSRP Intra-frequency relative accuracy requirements for the reported values for Cat-M1 UE in CEModeB

	Event	Test 1 All bands	Test 2 All bands	Test 3 All bands
Normal Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.58 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB

9.1.58.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in the intra frequency absolute and relative RSRP accuracies for HD-FDD intra frequency RSRP measurements for Cat-M1 UE in CEModeB.

9.1.58.2 Test applicability

This test applies to all types of E-UTRA HD-FDD UE release 13 and forward of UE category M1 that support CE Mode B. Applicability requires support for FGI bit 16.

9.1.58.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.57.3 with the following exceptions:

- Instead of Table 9.1.57.3-1 → use Table 9.1.58.3-1.
- Instead of Table 9.1.57.3-2 → use Table 9.1.58.3-2.

Table 9.1.58.3-1: RSRP Intra frequency absolute accuracy for UE category M1 with CE mode B for HD-FDD

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±8	±11	-15≤Ês/Iot≤-12 dB	FDD_A	-121	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E	-119	N/A	-70
±7	±10	≥-12 dB	FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_N	-114.5	N/A	-70
±10	±13	-15≤Ês/Iot≤-12 dB	FDD_A, FDD_D, FDD_E, FDD_F, FDD_G, FDD_N	N/A	-70	-50
±9	±12	≥-12 dB				
NOTE 1: Io is assumed to have constant EPRE across the bandwidth.						
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.						
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

Table 9.1.58.3-2: RSRP Intra frequency relative accuracy for UE category M1 with CE mode B for HD-FDD

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±4	±4	≥-12 dB	FDD_A	-121	-50
			FDD_D	-119.5	-50
			FDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_N	-114.5	-50
±5	±5	-15≤Ês/Iot≤-12 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.21.3, 9.1.21.4, 9.1.4, and A.9.1.58.

9.1.58.4 Test description

Same test description as in clause 9.1.57.4 with the following exceptions:

- Instead of Table 9.1.57.5-1 → use Table 9.1.58.5-1.
- Instead of Table 9.1.57.5-2 → use Table 9.1.58.5-2.
- Instead of Table 9.1.57.5-3 → use Table 9.1.58.5-3.

9.1.58.5 Test requirement

Table 9.1.58.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in Table 9.1.58.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in Table 9.1.58.5-3.

Table 9.1.58.5-1: HD-FDD RSRP Intra frequency test parameters for Cat-M1 UE in CEModeB

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel			R.12 HD-FDD	-	R.12 HD-FDD	-	R.12 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
MPDCCH Reference measurement channel			R.8 HD-FDD		R.8 HD-FDD		R.8 HD-FDD	
OCNG Patterns			OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD	OP.21 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-99.3		-79.3		-107	
	Bands FDD_B						-106.5	
	Bands FDD_C						-106	
	Bands FDD_D						-105.5	
	Bands FDD_E, FDD_F Note 5						-105	
	Bands FDD_G Note 7						-104	
	Bands FDD_H						-103.5	
$\hat{E}_s/N_{oc}$		dB	-12	-13.9	-12	-13.9	-12	-13.9
$\hat{E}_s/I_{ot}$		dB	-12.17	-14.17	-12.17	-14.17	-12.17	-14.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-111.3	-113.2	-91.3	-93.2	-119	-120.9
	Bands FDD_B						-118.5	-120.4
	Bands FDD_C						-118	-119.9
	Bands FDD_D						-117.5	-119.4
	Bands FDD_E, FDD_F Note 4						-117	-118.9
	Bands FDD_G Note 6						-116	-117.9
	Bands FDD_H						-115.5	-117.4
Io Note3	Bands FDD_A	dBm/9 MHz	-71.79		-51.79		-78.79	
	Bands FDD_B						-78.29	
	Bands FDD_C						-77.79	
	Bands FDD_D						-77.29	
	Bands FDD_E, FDD_F Note 4						-76.79	
	Bands FDD_G Note 6						-75.79	
	Bands FDD_H						-75.29	
Propagation condition		-	AWGN		AWGN		AWGN	
Antenna Configuration			1x1		1x1		1x1	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel

	bandwidth within 865-894 MHz.
Note 5:	E-UTRA operating band groups are as defined in Section 3.5.
Note 6:	Except Band 29 and Band 32.

Table 9.1.58.5-2: HD-FDD RSRP Intra frequency absolute accuracy requirements for the reported values for Cat-M1 UE in CEModeB

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
Lowest reported value (Cell 2)	RSRP_18	RSRP_36	Bands FDD_A	RSRP_10
			Bands FDD_B	RSRP_11
			Bands FDD_C	RSRP_11
			Bands FDD_D	RSRP_12
			Bands FDD_E, FDD_F	RSRP_12
			Bands FDD_G	RSRP_13
			Bands FDD_H	RSRP_14
Highest reported value (Cell 2)	RSRP_37	RSRP_59	Bands FDD_A	RSRP_29
			Bands FDD_B	RSRP_30
			Bands FDD_C	RSRP_30
			Bands FDD_D	RSRP_31
			Bands FDD_E, FDD_F	RSRP_31
			Bands FDD_G	RSRP_32
			Bands FDD_H	RSRP_33
Extreme Conditions	**Test 1 All bands**	**Test 2 All bands**	**Test 3**	
Lowest reported value (Cell 2)	RSRP_15	RSRP_33	Bands FDD_A	RSRP_7
			Bands FDD_B	RSRP_8
			Bands FDD_C	RSRP_8
			Bands FDD_D	RSRP_9
			Bands FDD_E, FDD_F	RSRP_9
			Bands FDD_G	RSRP_10
			Bands FDD_H	RSRP_11
Highest reported value (Cell 2)	RSRP_40	RSRP_62	Bands FDD_A	RSRP_32
			Bands FDD_B	RSRP_33
			Bands FDD_C	RSRP_33
			Bands FDD_D	RSRP_34
			Bands FDD_E, FDD_F	RSRP_34
			Bands FDD_G	RSRP_35
			Bands FDD_H	RSRP_36
Note 1: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.1.58.5-3: HD-FDD RSRP Intra frequency relative accuracy requirements for the reported values for Cat-M1 UE in CEModeB

	Event	Test 1 All bands	Test 2 All bands	Test 3 All bands
Normal and Extreme Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB

9.1.59.1 Test purpose

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements for TDD Intra-frequency RSRP measurements for Cat-M1 UE in CEModeB.

9.1.59.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 13 and forward of UE category M1. Applicability requires support for CE Mode B and FGI bit 16.

9.1.59.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.1.57.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.21.3, clause 9.1.21.4, clause 9.1.21.5 and A.9.1.59.

9.1.59.4 Test description

9.1.59.4.1 Initial conditions

Same initial conditions as in clause 9.1.57.4.1.

9.1.59.4.2 Test procedure

Same test procedure as in clause 9.1.57.4.2 with following exceptions:

- Instead of Table 9.1.57.5-1 → use Table 9.1.59.5-1.
- Instead of Table 9.1.57.5-2 → use Table 9.1.59.5-2.
- Instead of Table 9.1.57.5-2 → use Table 9.1.59.5-2.

9.1.59.4.3 Message contents

Same message content as in clause 9.1.57.4.3.

9.1.59.5 Test requirement

Table 9.1.59.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.1.59.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.1.59.5-3.

Table 9.1.59.5-1: TDD RSRP Intra-frequency test parameters for Cat-M1 UE in CEModeB

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in clause A.8.6			R.18 TDD	-	R.18 TDD	-	R.18 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
MPDCCH Reference measurement channel defined in clause A.7.6			R.16 TDD		R.16 TDD		R.16 TDD	
OCNG Patterns defined in clause D.2			OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD	OP.11 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
MPDCCH_RA								
MPDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-99.3		-79.3		-107	
	Bands TDD_C						-106	
	Bands TDD_E						-105	
$\hat{E}_s/N_{oc}$		dB	-12	-13.9	-12	-13.9	-12	-13.9
$\hat{E}_s/I_{ot}$		dB	-12.17	-14.17	-12.17	-14.17	-12.17	-14.17
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-111.3	-113.2	-91.3	-93.2	-119	-120.9
	Bands TDD_C						-118	-119.9
	Bands TDD_E						-117	-118.9
Io[Note4]	Bands TDD_A	dBm/9 MHz	-71.09		-51.09		-78.79	
	Bands TDD_C						-77.79	
	Bands TDD_E						-76.79	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.1.59.5-2: TDD RSRP Intra-frequency absolute accuracy requirements for the reported values for Cat-M1 UE in CEModeB

Normal Conditions	Event		Test 1	Test 2	Test 3
Lowest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_18	RSRP_36	RSRP_10
		Bands TDD_C			RSRP_11
		Bands TDD_E			RSRP_12
Highest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_37	RSRP_59	RSRP_29
		Bands TDD_C			RSRP_30
		Bands TDD_E			RSRP_31
Extreme Conditions	**Event**		**Test 1**	**Test 2**	**Test 3**
Lowest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_15	RSRP_33	RSRP_7
		Bands TDD_C			RSRP_8
		Bands TDD_E			RSRP_9
Highest reported value (Cell 2)	Cell 2	Bands TDD_A	RSRP_40	RSRP_62	RSRP_32
		Bands TDD_C			RSRP_33
		Bands TDD_E			RSRP_34

Table 9.1.59.5-3: TDD RSRP Intra-frequency relative accuracy requirements for the reported values for Cat-M1 UE in CEModeB

	Event	Test 1 All bands	Test 2 All bands	Test 3 All bands
Normal Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5
Extreme Conditions				
Lowest reported value (Cell 2)	Cell 1-2	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9	RSRP_Cell 1 – 9
Highest reported value (Cell 2)		RSRP_Cell 1 + 5	RSRP_Cell 1 + 5	RSRP_Cell 1 + 5

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.60 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with FDD PCell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Annex E needs to be updated

- Message contents need to be updated.

- Some minimum requirement parameter values are within brackets.

9.1.60.1 Test purpose

The purpose of this test is to verify that CSI- RSRP measurement accuracy is within the specified limits. This test will verify the absolute intra-frequency CSI-RSRP accuracy requirements of the SCells defined in TS 36.133 Section 9.1.18.4.4 for intra-frequency measurements under FS3, and the relative intra-frequency CSI-RSRP accuracy requirements between SCells defined in Section TS 36.133 9.1.18.4.5.

9.1.60.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA

9.1.60.3 Minimum conformance requirements

In this clause, absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on a serving carrier frequency operating under frame structure 3.

The accuracy requirements in Table 9.1.60.3-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in 36.133 Annex B.3.21.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.60.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
[±4.5]	[±9]	≥0 dB	FS3_G	-118	N/A	-70
[±8]	[±11]	≥0 dB	FS3_G	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP operating under frame structure 3. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.60.3-2 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in 36.133 Annex B.3.22.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.60.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
[±2]	[±3]	≥ 0 dB	FS3_G	-118	-50
[±3]	[±3]	≥ 0 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.60.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.60.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP _01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP _02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP _95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP _96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP _97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.18.4.1, 9.1.18.4.4, 9.1.18.4.5 and A.9.1.60.

9.1.60.4 Test description

9.1.60.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.60.4.3.
4. Cell 1 is PCell on the primary component carrier, Cell 2 using FS3 is SCell on the secondary component carrier and activated, and Cell 3 using FS3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.60.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2)
5. Set the parameters according to Table 9.1.60.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.60.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

The reported CSI-RSRP value of Cell 3 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.60.5-2. This counts as a Pass or Fail for the event “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

The reported CSI-RSRP value of Cell 3 is compared to the reported CSI-RSRP value of Cell 2 for each MeasurementReport message according to Table 9.1.60.5-3. This counts as a Pass or Fail for the event “Cell 2-3”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2”, “Cell 3” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.60.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

FFS.

9.1.60.5 Test requirement

Table 9.1.60.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP intra frequency with FDD PCell and FS3 SCells absolute accuracy shall meet the reported values test requirements in Table 9.1.60.5-2.

The CSI-RSRP intra frequency with FDD PCell and FS3 SCells relative accuracy shall meet the reported values test requirements in Table 9.1.60.5-3.

Table 9.1.60.5-1: CSI-RSRP carrier aggregation test parameters with FDD PCell and FS3 SCells

Parameter		Unit	Test 1		
			Cell 1	**Cell 2**	**Cell3**
Frame structure			FDD	FS3	FS3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	5 MHz: $N_{RB,c}$ = 25 10 MHz: $N_{RB,c}$ = 50 20 MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100
Timing offset to Cell 1		μs	-	0	3
Uplink/downlink configuration			-	Note10	Note10
Time alignment error relative to cell 1 Note 11			-	≤ TAE	-
DMTC period		ms	-	40	40
DMTC period offset		ms	-	10	10
Discovery signal occasion duration		ms	-	1	1
CSI-RS resource configuration			-	4	6
CSI-RS periodicity		ms	-	10	10
CSI-RS subframe offset		ms	-	0	0
CSI-RS individual offset[2]		dB	-	0	0
CSI-RS muting			-	Enable	Enable
LBT model			-	-	A.3.17
Measurement bandwidth		n_{PRB}	5 MHz: 10—15 10 MHz: 22—27 20 MHz: 47—52	47—52	47—52
PDSCH Reference measurement channel defined in A.3.1.1			5 MHz: R.5 FDD 10 MHz: R.0 FDD 20 MHz: R.4 FDD	R.0 FS3	R.0 FS3
PDSCH allocation		n_{PRB}	5 MHz: 7-17 10 MHz: 13-36 20 MHz: 38-61	38—61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5 MHz: R.11 FDD 10 MHz: R.6 FDD 20 MHz: R.10 FDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in A.3.2.1 and A.3.2.2			5 MHz: OP.15 FDD 10 MHz: OP.1 FDD 20 MHz: OP.11 FDD	OP.7 TDD	OP.8 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RANote1					
OCNG_RBNote					
p-C-r10[2]		dB	6+TT	6+TT	6+TT
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117+TT	-	-
	Bands FDD_B		-116.5+TT		
	Bands FDD_C		-116+TT		
	Bands FDD_D		-115.5+TT		
	Bands FDD_E, FDD_F Note 6		-115+TT		
	Bands FDD_G		-114+TT		
	Bands FDD_H		-113.5+TT		
	Bands FS3_G		-	(N_{oc} for Channel 1 + [1] dB) +TT	

CRS $\hat{E}_s/I_{ot}$		dB	[-4] +TT	[0.46] +TT	[-5.76] +TT
CSI-RS $\hat{E}_s/I_{ot}$		dB	-	[6.46] +TT	[0.24] +TT
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-121+TT	-	-
	Bands FDD_B		-120.5+TT		
	Bands FDD_C		-120+TT		
	Bands FDD_D		-119.5+TT		
	Bands FDD_E, FDD_F [Note 6]		-119+TT		
	Bands FDD_G		-118+TT		
	Bands FDD_H		-117.5+TT		
	Bands FS3_G		-	RSRP for Cell 1 + [8] dB) +TT	RSRP for Cell 1 + [4] dB) +TT
CSI-RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-115+TT	-	-
	Bands FDD_B		-114.5+TT		
	Bands FDD_C		-114+TT		
	Bands FDD_D		-113.5+TT		
	Bands FDD_E, FDD_F [Note 6]		-113+TT		
	Bands FDD_G		-112+TT		
	Bands FDD_H		-111.5+TT		
	Bands FS3_G		-	CSI-RSRP for Cell 1 + [8] dB) +TT	CSI-RSRP for Cell 1 + [4] dB) +TT
Io[Note3]	Bands FDD_A	dBm/ $BW_{channel}$	-87.76+10log($N_{RB,c}$/50) +TT	-	-
	Bands FDD_B		-87.26+10log($N_{RB,c}$/50) +TT		
	Bands FDD_C		-86.76+10log($N_{RB,c}$/50) +TT		
	Bands FDD_D		-86.26+10log($N_{RB,c}$/50) +TT		
	Bands FDD_E, FDD_F [Note 6]		-85.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_G		-84.76 +10log($N_{RB,c}$/50) +TT		
	Bands FDD_H		-84.26 +10log($N_{RB,c}$/50) +TT		
	Bands FS3_G		-	(Io for Channel 1 + [5.33] dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$)) +TT	
CRS $\hat{E}_s/N_{oc}$		dB	[-4] +TT	[3] +TT	[-1] +TT
CSI-RS $\hat{E}_s/N_{oc}$		dB	-	[9] +TT	[5] +TT
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.

Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.

Note 7: Void

Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Note 9:	DMTC configurations are provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test.
Note 10:	Downlink only configuration
Note 11:	Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.1.60.5-2: CSI-RSRP Intra frequency with FDD PCell and FS3 SCells absolute accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	FFS
Highest reported value (Cell 2)		FFS
Lowest reported value (Cell 3)	Cell 3	FFS
Highest reported value (Cell 3)		FFS
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	FFS
Highest reported value (Cell 2)		FFS
Lowest reported value (Cell 3)	Cell 3	FFS
Highest reported value (Cell 3)		FFS

Table 9.1.60.5-3: CSI-RSRP Intra frequency with FDD PCell and FS3 SCells relative accuracy requirements for the reported values

	Event	All bands
Normal and Extreme Conditions		
Lowest reported value	Cell 2-3	FFS
Highest reported value		FFS

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.61 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with TDD PCell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- The Test system uncertainties applicable to this test are undefined

- The Test tolerances applicable to this test are undefined

- Annex E needs to be updated

- Message contents need to be updated.

- Some minimum requirement parameter values are within brackets.

9.1.61.1 Test purpose

The purpose of this test is to verify that CSI- RSRP measurement accuracy is within the specified limits. This test will verify the absolute intra-frequency CSI-RSRP accuracy requirements of the SCells defined in TS 36.133 Section 9.1.18.4.4 for intra-frequency measurements under FS3, and the relative intra-frequency CSI-RSRP accuracy requirements between SCells defined in Section TS 36.133 9.1.18.4.5.

9.1.61.2 Test applicability

This test case applies to all types of E-UTRA UE release 13 and forward that support DL LAA

9.1.61.3 Minimum conformance requirements

In this clause, absolute CSI-RSRP measurement accuracy requirements in discovery signal occasions apply to a cell or TP on a serving carrier frequency operating under frame structure 3.

The accuracy requirements in Table 9.1.61.3-1 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP,

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in 36.133 Annex B.3.21.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.61.3-1: Intra-frequency absolute CSI-RSRP measurement accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	CSI Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/BW$_{Channel}$	dBm/BW$_{Channel}$
[±4.5]	[±9]	≥0 dB	FS3_G	-118	N/A	-70
[±8]	[±11]	≥0 dB	FS3_G	N/A	-70	-50

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 3: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

In this section, the relative CSI-RSRP measurement is defined as the CSI-RSRP measured from one cell or TP compared to the CSI-RSRP measured on the same frequency from another cell or from another TP operating under frame structure 3. If two TPs are compared, they may belong to the same or different cells.

The accuracy requirements in Table 9.1.61.3-2 are valid under the following conditions:

CSI reference signals in discovery signal occasions are transmitted on one antenna port only from each TP.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

CSI-RSRP is as specified in 36.133 Annex B.3.22.3 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least two CSI REs per resource block within the measured bandwidth in two adjacent slots of the same subframe or different subframes.

Table 9.1.61.3-2: Intra-frequency relative CSI-RSRP measurement accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	CSI Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
[±2]	[±3]	≥ 0 dB	FS3_G	-118	-50
[±3]	[±3]	≥ 0 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter CSI Ês/Iot is the minimum CSI Ês/Iot of the pair of cells or TPs to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in TS 36.133 Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in TS 36.133 Section 3.5.

The reporting range of CSI-RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.61.3-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.61.3-3: CSI-RSRP measurement report mapping

Reported value	Measured quantity value	Unit
CSI_RSRP_00	CSI_RSRP < -140	dBm
CSI_RSRP _01	-140 ≤ CSI_RSRP < -139	dBm
CSI_RSRP _02	-139 ≤ CSI_RSRP < -138	dBm
…	…	…
CSI_RSRP _95	-46 ≤ CSI_RSRP < -45	dBm
CSI_RSRP _96	-45 ≤ CSI_RSRP < -44	dBm
CSI_RSRP _97	-44 ≤ CSI_RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.18.4.1, 9.1.18.4.4, 9.1.18.4.5 and A.9.1.61.

9.1.61.4 Test description

9.1.61.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 20MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.42.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.61.4.3.
4. Cell 1 is PCell on the primary component carrier, Cell 2 using FS3 is SCell on the secondary component carrier and activated, and Cell 3 using FS3 is the neighbouring cell on the secondary component carrier. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.1.61.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2)
5. Set the parameters according to Table 9.1.61.5-1 as appropriate. Propagation conditions are set according to Annex B clauses B.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported CSI-RSRP values in periodical MeasurementReport messages.

The reported CSI-RSRP value of Cell 2 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.61.5-2. This counts as a Pass or Fail for the event “Cell 2”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

The reported CSI-RSRP value of Cell 3 reported by the UE is compared to actual CSI-RSRP value according to Table 9.1.61.5-2. This counts as a Pass or Fail for the event “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

The reported CSI-RSRP value of Cell 3 is compared to the reported CSI-RSRP value of Cell 2 for each MeasurementReport message according to Table 9.1.61.5-3. This counts as a Pass or Fail for the event “Cell 2-3”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 2”, “Cell 3” and “Cell 2-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.1.61.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

FFS.

9.1.61.5 Test requirement

Table 9.1.61.5-1 defines the primary level settings including test tolerances for all tests.

The CSI-RSRP intra frequency with TDD PCell and FS3 SCells absolute accuracy shall meet the reported values test requirements in Table 9.1.61.5-2.

The CSI-RSRP intra frequency with TDD PCell and FS3 SCells relative accuracy shall meet the reported values test requirements in Table 9.1.61.5-3.

Table 9.1.61.5-1: CSI-RSRP carrier aggregation test parameters with TDD PCell and FS3 SCells

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell3
Frame structure			TDD	FS3	FS3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100	20 MHz: $N_{RB,c}$ = 100
Timing offset to Cell1		µs	-	0	3
Special subframe configuration Note1			6	Note10	Note10
Uplink/downlink configuration Note1			1	Note10	Note10
Time alignment error relative to cell 1 Note 11			-	≤ TAE	-
DMTC period		ms	-	40	40
DMTC period offset		ms	-	10	10
Discovery signal occasion duration		ms	-	1	1
CSI-RS resource configuration			-	4	6
CSI-RS periodicity		ms	-	10	10
CSI-RS subframe offset		ms	-	0	0
CSI-RS individual offset[2]		dB	-	0	0
CSI-RS muting			-	Enable	Enable
LBT model			-	-	A.3.17
Measurement bandwidth		n_{PRB}	5 MHz: 10—15 10 MHz: 22—27 20 MHz: 47—52	47—52	47—52
PDSCH Reference measurement channel defined in A.3.1.1			5 MHz: R.4 TDD 10 MHz: R.0 TDD 20 MHz: R.3 TDD	R.0 FS3	R.0 FS3
PDSCH allocation		n_{PRB}	5 MHz: 7-17 10 MHz: 13-36 20 MHz: 38-61	38—61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5 MHz: R.11 TDD 10 MHz: R.6 TDD 20 MHz: R.10 TDD	R.0 FS3	R.0 FS3
OCNG Patterns defined in A.3.2.2			5 MHz: OP.9 TDD 10 MHz: OP.1 TDD 20 MHz: OP.7 TDD	OP.7 TDD	OP.8 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0
p-C-r10[2]		dB	6+TT	6+TT	6+TT
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-117+TT	-	-
	Bands TDD_C		-116+TT		
	Bands TDD_E		-115+TT		
	Bands FS3_G		-	(N_{oc} for Channel 1 + [1] dB) +TT	
CRS $\hat{E}_s/I_{ot}$		dB	[-4] +TT	[0.46] +TT	[-5.76] +TT
CSI-RS $\hat{E}_s/I_{ot}$		dB	-	[6.46] +TT	[0.24] +TT

RSRP[Note3]	Bands TDD_A	dBm/15 kHz	-121+TT	-	-
	Bands TDD_C		-120+TT		
	Bands TDD_E		-119+TT		
	Bands FS3_G		-	RSRP for Cell 1 + [8] dB) +TT	RSRP for Cell 1 + [4] dB) +TT
CSI-RSRP[Note3]	Bands TDD_A	dBm/15 kHz	-115+TT	-	-
	Bands TDD_C		-114+TT		
	Bands TDD_E		-113+TT		
	Bands FS3_G		-	CSI-RSRP for Cell 1 + [8] dB) +TT	CSI-RSRP for Cell 1 + [4] dB) +TT
Io[Note3]	Bands TDD_A	dBm/ $BW_{channel}$	-87.76+10log($N_{RB,c}$/50) +TT	-	-
	Bands TDD_C		-86.76+10log($N_{RB,c}$/50) +TT		
	Bands TDD_E		-85.76 +10log($N_{RB,c}$/50) +TT		
	Bands FS3_G		-	(Io for Channel 1 + [5.33] dB +10log ($N_{RB\ channel2}$ / $N_{RB\ channel\ 1}$)) +TT	
CRS $\hat{E}_s/N_{oc}$		dB	[-4] +TT	[3] +TT	[-1] +TT
CSI-RS $\hat{E}_s/N_{oc}$		dB	-	[9] +TT	[5] +TT
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement subframe.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6: Void
Note 7: Void
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: DMTC configurations are provided to the UE in the *measDS-Config* (in TS36.331) before the beginning of the test.
Note 10: Downlink only configuration
Note 11: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.1.61.5-2: CSI-RSRP Intra frequency with TDD PCell and FS3 SCells absolute accuracy requirements for the reported values

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	FFS
Highest reported value (Cell 2)		FFS
Lowest reported value (Cell 3)	Cell 3	FFS
Highest reported value (Cell 3)		FFS
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	FFS
Highest reported value (Cell 2)		FFS
Lowest reported value (Cell 3)	Cell 3	FFS
Highest reported value (Cell 3)		FFS

Table 9.1.61.5-3: CSI-RSRP Intra frequency with TDD PCell and FS3 SCells relative accuracy requirements for the reported values

	Event	All bands
Normal and Extreme Conditions		
Lowest reported value	Cell 2-3	FFS
Highest reported value		FFS

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2 RSRQ

9.2.1 FDD Intra frequency RSRQ Accuracy

9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy

9.2.1.1.1 Test purpose

To verify that the FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.2.1.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.1.1.3-1: RSRQ FDD intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.1.1.3-2.

Table 9.2.1.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1 and A.9.2.1.

9.2.1.1.4 Test description

9.2.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.1.1.4.3.

4. There is one E-UTRA FDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.1.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.1.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.1.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.1.1.5-2 as appropriate.

9.2.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.1.1.4.3-1: Common Exception messages for RSRQ FDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.1.1.4.3-2: *MeasResults*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.1.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.1.1.5 Test requirement

Table 9.2.1.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.1.1.5-3.

Table 9.2.1.1.5-1: Void

Table 9.2.1.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.51		-103.85		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F Note 5						-117.60	-117.60
	Bands FDD_G						-116.60	-116.60
	Bands FDD_H						-116.10	-116.10
RSRQ Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Bands FDD_H	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12

Io[Note3]	Bands FDD_A	dBm/9 MHz	-50.75		-73.00		-85.49	
	Bands FDD_C						-84.49	
	Bands FDD_D						-83.99	
	Bands FDD_E, FDD_F [Note 5]						-83.49	
	Bands FDD_G						-82.49	
	Bands FDD_H						-81.99	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.1.1.5-3: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.2 TDD Intra frequency RSRQ Accuracy

9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy

9.2.2.1.1 Test purpose

To verify that the TDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all TDD bands.

9.2.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bit 16.

9.2.2.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.2.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.2.1.3-1: RSRQ TDD intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.2.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.2.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.2.2.

9.2.2.1.4 Test description

9.2.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.2.1.4.3.

4. There is one E-UTRA TDD carrier and two cells specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.2.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ according to Table 9.2.2.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.2.1.5-2 as appropriate.

9.2.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.2.1.4.3-1: Common Exception messages for RSRQ TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.2.1.4.3-2: *MeasResults*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResuCellItsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.2.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
measResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.2.1.5 Test requirement

Table 9.2.2.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.2.1.5-3.

Table 9.2.2.1.5-1: Void

Table 9.2.2.1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink-downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-85.51		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	Bands TDD_C						-118.60	-118.60
	Bands TDD_E						-117.60	-117.60
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io[Note4]	Bands TDD_A	dBm/9 MHz	-50.75		-73.00		-85.49	
	Bands TDD_C						-84.49	
	Bands TDD_E						-83.49	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.2.1.5-3: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3 FDD - FDD Inter frequency RSRQ Accuracy

9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy

9.2.3.1.1 Test purpose

To verify that the FDD - FDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.3.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.3.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.3.1.3-1: RSRQ FDD - FDD inter frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.1.3-2.

Table 9.2.3.1.3-2: RSRQ FDD - FDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.3.

9.2.3.1.4 Test description

9.2.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.3.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.3.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.3.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.3.1.5-2 as appropriate.

9.2.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.3.1.4.3-1: Common Exception messages for RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.1.4.3-2: *MeasResults*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.3.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.3.1.5 Test requirement

Table 9.2.3.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.3.1.5-3.

Table 9.2.3.1.5-1: Void

Table 9.2.3.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-80.0	-81.1	-104.7	-104.7	-119.5	-119.2
	Bands FDD_C						-118.5	-118.2
	Bands FDD_D						-118	-117.7
	Bands FDD_E, FDD_F Note 5						-117.5	-117.2
	Bands FDD_G						-116.5	-116.2
	Bands FDD_H						-116	-115.7
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note3	Bands FDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.5	-122.4
	Bands FDD_C						-122.5	-121.4
	Bands FDD_D						-122.0	-120.9
	Bands FDD_E, FDD_F Note 5						-121.5	-120.4
	Bands FDD_G						-120.5	-119.4
	Bands FDD_H						-120.0	-118.9
RSRQ Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Bands FDD_H	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note3	Bands FDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands FDD_C						-89.26	-88.72
	Bands FDD_D						-88.76	-88.22
	Bands FDD_E, FDD_F Note 5						-88.26	-87.72
	Bands FDD_G						-87.26	-86.72
	Bands FDD_H						-86.76	-86.22
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2

Propagation condition	-	AWGN	AWGN	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.				

Table 9.2.3.1.5-3: RSRQ FDD - FDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ

9.2.3.2.1 Test purpose

To verify that the FDD - FDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.3.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.3.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.3.2.3-1: RSRQ FDD - FDD inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.2.3-2.

Table 9.2.3.2.3-2: RSRQ FDD - FDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.3.

9.2.3.2.4 Test description

9.2.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.3.2.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.3.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.3.2.5-2 as appropriate.

9.2.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.3.2.4.3-1: Common Exception messages for RSRQ FDD - FDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.2.4.3-2: *MeasResults*: Additional RSRQ FDD - FDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.3.2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.3.2.5 Test requirement

Table 9.2.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.3.2.5-3.

Table 9.2.3.2.5-1: Void

Table 9.2.3.2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-81.1	-81.1	-104.7	-104.7	-119.5	-119.2
	Bands FDD_C						-118.5	-118.2
	Bands FDD_D						-118	-117.7
	Bands FDD_E, FDD_F Note 5						-117.5	-117.2
	Bands FDD_G						-116.5	-116.2
	Bands FDD_H						-116	-115.7
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note3	Bands FDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.5	-122.4
	Bands FDD_C						-122.5	-121.4
	Bands FDD_D						-122.0	-120.9
	Bands FDD_E, FDD_F Note 5						-121.5	-120.4
	Bands FDD_G						-120.5	-119.4
	Bands FDD_H						-120.0	-118.9
RSRQ Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Bands FDD_H	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note3	Bands FDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands FDD_C						-89.26	-88.72
	Bands FDD_D						-88.76	-88.22
	Bands FDD_E, FDD_F Note 5						-88.26	-87.72
	Bands FDD_G						-87.26	-86.72
	Bands FDD_H						-86.76	-86.22
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2

Propagation condition	-	AWGN	AWGN	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in section 3.5.				

Table 9.2.3.2.5-3: RSRQ FDD inter frequency relative accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x +8	RSRQ_x +11	RSRQ_x +11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4 TDD - TDD Inter frequency RSRQ Accuracy

9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy

9.2.4.1.1 Test purpose

To verify that the TDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or RSRQ value of Cell 2 reported by the UE four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.4.1.3-1: RSRQ TDD - TDD inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.2.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.4.

9.2.4.1.4 Test description

9.2.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4.1.4.3.

4. There are two E-UTRA TDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.4.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.1.5-2 as appropriate.

9.2.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.1.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.1.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell	SEQUENCE {		
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.1.5 Test requirement

Table 9.2.4.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4.2.5-3.

Table 9.2.4.1.5-1: Void

Table 9.2.4.1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note2								
OCNG_RB Note2								
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-80.0	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-81.75	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-50.00	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in TS 36.133 [4] section 3.5.

Table 9.2.4.1.5-3: RSRQ TDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRQ

9.2.4.2.1 Test purpose

To verify that the TDD - TDDinter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{\text{dBm}}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.4.2.3-1: RSRQ TDD - TDD Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.2.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.4.

9.2.4.2.4 Test description

9.2.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4.2.4.3.

4. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.4.2.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.1.5-2 as appropriate.

9.2.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.2.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.1.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.2.5 Test requirement

Table 9.2.4.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4.2.5-3.

Table 9.2.4.2.5-1: Void

Table 9.2.4.2.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-81.1	-81.1	-104.70	-104.70	-119.50	-119.20
	Bands TDD_C						-118.50	-118.20
	Bands TDD_E						-117.50	-117.20
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-82.85	-82.85	-108.70	-107.90	-123.50	-122.40
	Bands TDD_C						-122.50	-121.40
	Bands TDD_E						-121.50	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note4	Bands TDD_A	dBm/9 MHz	-51.10	-51.10	-75.46	-75.22	-90.26	-89.72
	Bands TDD_C						-89.26	-88.72
	Bands TDD_E						-88.26	-87.72
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.4.2.5-3: RSRQ TDD - TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x -9	RSRQ_x -9
Highest reported value (Cell 2)	RSRQ_x + 8	RSRQ_x + 11	RSRQ_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4A FDD - TDD Inter frequency RSRQ Accuracy

9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy

9.2.4A.1.1 Test purpose

To verify that the FDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4A.1.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4A.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4A.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.3 for a corresponding Band.

Table 9.2.4A.1.3-1: RSRQ FDD - TDD inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4A.1.3-2.

Table 9.2.4A.1.3-2: RSRQ FDD - TDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.4A.

9.2.4A.1.4 Test description

9.2.4A.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4A.1.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.4A.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4A.1.5-1 and 9.2.4A.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, the SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.4A.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.4A.1.5-1 and 9.2.4A.1.5-2 as appropriate.

9.2.4A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4A.1.4.3-1: Common Exception messages for RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4A.1.4.3-2: *MeasResults*: Additional RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4A.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4A.1.5 Test requirement

Table 9.2.4A.1.5-1 and 9.2.4A.1.5-2 define the primary level settings including test tolerances for all tests.

Each RSRQ FDD - TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4A.1.5-3.

Table 9.2.4A.1.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency absolute accuracy (FDD Cell1)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
E-UTRA RF Channel Number		1	1	1
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		0	0	0
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD	R.0 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	13—36	13—36	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1	dB	0	0	0
N_{oc} Note2	dBm/15 kHz	-80	-104.70	-114.5
$\hat{E}_s/I_{ot}$	dB	-1.75	-4.0	-4.0
RSRP Note3	dBm/15 kHz	-81.75	-108.70	-118.5
RSRQ Note3	dB	-14.76	-16.25	-16.25
Io Note3	dBm/9 MHz	-50	-75.46	-85.26
$\hat{E}_s/N_{oc}$	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency absolute accuracy (TDD Cell2)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.2		-	-	-
PDSCH allocation	n_{PRB}	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	dBm/15 kHz	-81.10	-104.70	-114.50
$\hat{E}_s/I_{ot}$	dB	-1.75	-3.20	-3.20
RSRP Note4	dBm/15 kHz	-82.85	-107.9	-117.70
RSRQ Note4	dB	-14.76	-15.69	-15.69
Io Note4	dBm/9 MHz	-51.10	-75.22	-85.02
$\hat{E}_s/N_{oc}$	dB	-1.75	-3.20	-3.20
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.1.5-3: RSRQ FDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ

9.2.4A.2.1 Test purpose

To verify that the FDD - TDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4A.2.2 Test applicability

This test applies to all types of E-UTRA UE supporting FDD and TDD release 9 and forward. Applicability requires support for FGI bits 16 and 25.

9.2.4A.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4A.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.4A.2.3-1: RSRQ FDD - TDD inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.4A.2.3-2.

Table 9.2.4A.2.3-2: RSRQ FDD - TDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.4A.

9.2.4A.2.4 Test description

9.2.4A.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4A.2.4.3.

4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.4A.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.4A.2.5-1 and 9.2.4A.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, the SS shall check the RSRQ value of Cell 1 and Cell 2 in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.4A.2.5-1 and 9.2.4A.2.5-2 as appropriate.

9.2.4A.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4A.2.4.3-1: Common Exception messages for RSRQ FDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4A.2.4.3-2: *MeasResults*: Additional RSRQ FDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4A.2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4A.2.5 Test requirement

Table 9.2.4A.2.5-1 and 9.2.4A.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4A.2.5-3.

Table 9.2.4A.2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency relative accuracy (FDD Cell1)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 1	Cell 1	Cell 1
E-UTRA RF Channel Number		1	1	1
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		0	0	0
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1		R.0 FDD	R.0 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	13—36	13—36	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1		R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1	dB	0	0	0
N_{oc} Note2	dBm/15 kHz	-81.10	-104.70	-114.5
$\hat{E}_s/I_{ot}$	dB	-1.75	-4.0	-4.0
RSRP Note3	dBm/15 kHz	-82.85	-108.70	-118.5
RSRQ Note3	dB	-14.76	-16.25	-16.25
Io Note3	dBm/9 MHz	-51.10	-75.46	-85.26
$\hat{E}_s/N_{oc}$	dB	-1.75	-4.0	-4.0
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - TDD inter frequency relative accuracy (TDD cell2)

Parameter	Unit	Test 1	Test 2	Test 3
		Cell 2	Cell 2	Cell 2
E-UTRA RF Channel Number		2	2	2
$BW_{channel}$	MHz	10	10	10
Gap Pattern Id		-	-	-
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration Note1		1	1	1
Measurement bandwidth	n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.2		-	-	-
PDSCH allocation	n_{PRB}	-	-	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2	dB	0	0	0
N_{oc} Note3	dBm/15 kHz	-81.10	-104.70	-114.50
$\hat{E}_s/I_{ot}$	dB	-1.75	-3.20	-3.20
RSRP Note4	dBm/15 kHz	-82.85	-107.90	-117.70
RSRQ Note4	dB	-14.76	-15.69	-15.69
Io Note4	dBm/9 MHz	-51.10	-75.22	-85.02
$\hat{E}_s/N_{oc}$	dB	-1.75	-3.20	-3.20
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4A.2.5-3: RSRQ FDD-TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x-8	RSRQ_x-10	RSRQ_x-10
Highest reported value (Cell 2)	RSRQ_x+8	RSRQ_x+10	RSRQ_x+10
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x-10	RSRQ_x-10	RSRQ_x-10
Highest reported value (Cell 2)	RSRQ_x+10	RSRQ_x+10	RSRQ_x+10
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.5 FDD RSRQ for E-UTRA Carrier Aggregation

9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation

9.2.5.1.1 Test purpose

To verify that FDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.5.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.5.1.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The FDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.5.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.5.1.3-1: FDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.5.1.3-2.

Table 9.2.5.1.3-2: FDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.5.

9.2.5.1.4 Test description

9.2.5.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.5.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.5.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.5.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.5.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.5.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.5.1.5 Test requirement

Table 9.2.5.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.1.5-2.

Table 9.2.5.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel\_CA}$		MHz	10	10	10
Time offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-116	
	Bands FDD_C		-118.5	-115	
	Bands FDD_D		-118	-114.5	
	Bands FDD_E, FDD_F Note 6		-117.5	-114	
	Bands FDD_G		-116.5	-113	
	Bands FDD_H		-116	-112.5	
$\hat{E}_s/I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP Note3	Bands FDD_A	dBm/15 kHz	-123.5	-119.7	-120
	Bands FDD_C		-122.5	-118.7	-119
	Bands FDD_D		-122	-118.2	-118.5
	Bands FDD_E, FDD_F Note 6		-121.5	-117.7	-118
	Bands FDD_G		-120.5	-116.7	-117

	Bands FDD_H		-120	-116.2	-116.5
RSRQ[Note3]	Bands FDD_A	dB	-16.25	-17.10	-17.40
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io[Note3]	Bands FDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands FDD_C		-89.26	-84.61	
	Bands FDD_D		-88.76	-84.11	
	Bands FDD_E, FDD_F Note 6		-88.26	-83.67	
	Bands FDD_G		-87.26	-82.61	
	Bands FDD_H		-86.76	-82.11	
$\hat{E}_s/N_{oc}$		dB	-4.0	-3.7	-4.0
Propagation condition		-	AWGN		

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs
NOTE 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz
NOTE 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.5.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	

Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.5.2 FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation

9.2.5.2.1 Test purpose

To verify that FDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.5.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.5.2.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.5.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.5.2.3-1: FDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.5.2.3-2.

Table 9.2.5.2.3-2: FDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.5.

9.2.5.2.4 Test description

9.2.5.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.5.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.5.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.5.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.5.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.5.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.5.2.5 Test requirement

Table 9.2.5.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.5.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel\_CA}$		MHz	10	10	10
Time offset to Cell 1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Measurement bandwidth		n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.6 FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-116	
	Bands FDD_C		-118.5	-115	
	Bands FDD_D		-118	-114.5	
	Bands FDD_E, FDD_F Note 6		-117.5	-114	
	Bands FDD_G		-116.5	-113	
	Bands FDD_H		-116	-112.5	
$\hat{E}_s/I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP Note3	Bands FDD_A	dBm/15 kHz	-123.5	-119.7	-120
	Bands FDD_C		-122.5	-118.7	-119
	Bands FDD_D		-122	-118.2	-118.5
	Bands FDD_E, FDD_F Note 6		-121.5	-117.7	-118
	Bands FDD_G		-120.5	-116.7	-117

	Bands FDD_H		-120	-116.2	-116.5
RSRQ[Note3]	Bands FDD_A	dB	-16.25	-17.10	-17.40
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io[Note3]	Bands FDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands FDD_C		-89.26	-84.61	
	Bands FDD_D		-88.76	-84.11	
	Bands FDD_E, FDD_F Note 6		-88.26	-83.61	
	Bands FDD_G		-87.26	-82.61	
	Bands FDD_H		-86.76	-82.11	
$\hat{E}_s/N_{oc}$		dB	-4.0	-3.7	-4.0
Propagation condition		-	AWGN		

NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs
NOTE 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz
NOTE 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.5.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12

Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.6 TDD RSRQ for E-UTRA Carrier Aggregation

9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation

9.2.6.1.1 Test purpose

To verify that TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.6.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.6.1.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The TDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.6.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.6.1.3-1: TDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.6.1.3-2.

Table 9.2.6.1.3-2: TDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.6.

9.2.6.1.4 Test description

9.2.6.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.6.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.6.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2) [and (Cell 3)].

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.6.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.6.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.6.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.6.1.5 Test requirement

Table 9.2.6.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.6.1.5-2.

Table 9.2.6.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10		
Timing offset to cell1		μs	-	0	3μs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.5	-116	
	Bands TDD_C		-118.5	-115	
	Bands TDD_E		-117.5	-114	
$\hat{E}_s/I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-123.50	-119.7	-120
	Bands TDD_C		-122.50	-118.7	-119
	Bands TDD_E		-121.50	-117.7	-118
RSRQ[Note4]	Bands TDD_A	dB	-16.25	-17.10	-17.40
Io[Note4]	Bands TDD_C	dBm/9 MHz	-90.26	-85.61	
	Bands TDD_E		-89.26	-84.61	
	Bands TDD_A		-88.26	-83.61	
$\hat{E}_s/N_{oc}$		dB	-4.0	-3.70	-4.0
Propagation condition		-	AWGN		

NOTE 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
NOTE 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
NOTE 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.6.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation

9.2.6.2.1 Test purpose

To verify that TDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.6.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.6.2.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.6.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.6.2.3-1: TDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.6.2.3-2.

Table 9.2.6.2.3-2: TDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.6.

9.2.6.2.4 Test description

9.2.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.6.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.6.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.6.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.6.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.6.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.6.2.5 Test requirement

Table 9.2.6.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.6.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10		
Timing offset to cell1		µs	-	0	3µs or 92*Ts
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1.	-
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.5	-116	
	Bands TDD_C		-118.5	-115	
	Bands TDD_E		-117.5	-114	
$\hat{E}_s/I_{ot}$		dB	-4.0	-5.16	-5.54
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-123.50	-119.7	-120
	Bands TDD_C		-122.50	-118.7	-119
	Bands TDD_E		-121.5	-117.7	-118
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-16.25	-17.10	-17.40
Io[Note4]	Bands TDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands TDD_C		-89.26	-84.61	
	Bands TDD_E		-88.26	-83.61	
$\hat{E}_s/N_{oc}$		dB	-4.0	-3.7	-4.0
Propagation condition		-	AWGN		

NOTE 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

NOTE 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6:	The selection of the bands for testing depends on the configuration of the carrier aggregations supported by the UEs.
NOTE 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.6.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.7 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.2.7.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits for all bands.

9.2.7.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.2.7.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.7.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band, The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.7.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 4	$dBm/BW_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.7.1.3-2.

Table 9.2.7.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.7.

9.2.7.1.4 Test description

9.2.7.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.7.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.7.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.7.1.4.1-1: General test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells 3μs or 92*Ts
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})$mod6 !=0	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met.
ABS pattern		'1000000010000000100000001000000010000000'	Non-MBSFN ABS. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'1000000010000000100000001000000010000000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'0100000001000000010000000100000001000000'	Configured for measurements on Cell 1.

9.2.7.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table 9.2.7.1.4.1-1 and Table 9.2.7.1.5-1 for non-MBSFN ABS with non-colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.7.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.7.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.7.1.5-1 as appropriate.

9.2.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.7.1.4.3-1: Common Exception messages for RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4 Table H.3.5-5

Table 9.2.7.1.4.3-2: *MeasResults*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.7.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.7.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	'0100000001000000010000000100000001000000'	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.2.7.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	'1000000010000000100000001000000010000000'	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.2.7.1.5 Test requirement

Table 9.2.7.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.7.1.5-2.

Table 9.2.7.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.5 (OP.5 FDD) and D.1.6 (OP.6 FDD)			OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 7						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s/N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $\left(\hat{E}_s/I_{ot}\right)_{meas}$ Note 5		dB	2.55	-1.20	2.55	-1.20	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP Note3,4,5	Bands FDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F Note 7						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands FDD_A, FDD_C, FDD_E, FDD_F Note 7, FDD_G, FDD_H	dB	-12.71	-14.80	-12.71	-14.80	-12.47	-16.01
$(\mathrm{Io})_{meas}$ Note3	Bands FDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.54	-85.16
	Bands FDD_C						-80.54	-84.16
	Bands FDD_D						-80.04	-83.66
	Bands FDD_E, FDD_F Note 7						-79.54	-83.16
	Bands FDD_G						-78.54	-82.16
	Bands FDD_H						-78.04	-81.66

Propagation condition	-	AWGN	AWGN	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: Applies to restricted measurement subframes of the respective cell. Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1 Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 8: E-UTRA operating band groups are as defined in Section 3.5.				

Table 9.2.7.1.5-2: RSRQ FDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.8 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS

9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)

9.2.8.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction is within the specified limits for all bands.

9.2.8.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 115.

9.2.8.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.8.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.8.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction

Accuracy		Conditions			
Normal condition	**Extreme condition**	**Ês/Iot**	**Io Note 2 range**		
			E-UTRA operating band groups Note 5	**Minimum Io**	**Maximum Io**
dB	**dB**	**dB**		dBm/ **15kHz** Note 1, 4	**dBm/BW$_{Channel}$**
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.8.1.3-2.

Table 9.2.8.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.8.

9.2.8.1.4 Test description

9.2.8.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.8.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.8.1.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.8.1.4.1-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with non-MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	Also the aggressor cell.
Neighbour cell		Cell 2	Cell to be measured
PCell ABS configuration		Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [9].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [9].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 μs	Synchronous cells 3μs or 92*Ts
Physical cell ID PCI		$(PCI_{cell1} - PCI_{cell2})mod6$!=0	Cell PCIs for Cell 1 and Cell 2 are randomly selected so that the condition is met
ABS pattern		'00000000010000000001'	Non-MBSFN ABS. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes in Cell 1.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00000000010000000001'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for Cell 1 measurements.

9.2.8.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction is tested by using the parameters in Table 9.2.8.1.4.1-1 and Table 9.2.8.1.5-1 for non-MBSFN ABS with non-colliding CRS. In all test cases, Cell 1 is the serving cell and also the aggressor cell to Cell 2. Cell 2 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time-domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells and provided with a neighbour cell list associated with the pattern, where the cell list includes Cell 2. The UE is also configured with a time-domain measurement resource restriction pattern for the serving cell measurements. The information for both patterns shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.8.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.8.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.8.1.5-1 as appropriate.

9.2.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.8.1.4.3-1: Common Exception messages for RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.8.1.4.3-2: *MeasResults*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.8.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.8.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.2.8.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00000000010000000001'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

9.2.8.1.5 Test requirement

Table 9.2.8.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.8.1.5-2.

Table 9.2.8.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with non-MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s/N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $\left(\hat{E}_s/I_{ot}\right)_{meas}$ Note 5		dB	2.55	-1.20	2.55	-1.20	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP[Note3,4,5]	Bands TDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	-12.71	-14.80	-12.71	-14.80	-12.47	-16.01
$(\mathrm{Io})_{meas}$ Note3	Bands TDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.54	-85.16
	Bands TDD_C						-80.54	-84.16
	Bands TDD_E						-79.54	-83.16
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes of the respective cell.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.

Table 9.2.8.1.5-2: RSRQ TDD Intra frequency under time domain measurement resource restriction with non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_19

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.9 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS

9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.2.9.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with MBSFN ABS is within the specified limits for all bands.

9.2.9.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support of FGI bit 115.

9.2.9.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.9.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.9.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with MBSFN ABS

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/ 15kHz Note 1, 4	dBm/$BW_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.9.1.3-2.

Table 9.2.9.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.9.

9.2.9.1.4 Test description

9.2.9.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.9.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.9.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.2.9.1.4.1-1: General test parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
PDSCH parameters Note 1		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters Note 1		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Serving cell (PCell)		Cell 1	Also the aggressor cell on E-UTRA RF channel number 1
Neighbour cell		Cell 2	Cell to be identified on E-UTRA RF channel number 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For all cells in the test
PCell ABS configuration		MBSFN ABS	As defined in Table C.3.1.2.1-1
CP length		Normal	
DRX		OFF	
Time offset between cells		3 μs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2}) mod 6 = 0, PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs are selected so that the condition is met (colliding CRS)
Cell 1 MBSFN ABS pattern		‘0100000010000000100000000010000001000000’	ABS subframe is only MBSFN subframe. FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. Configured in Cell 1.
Time domain measurement resource restriction pattern for PCell (Cell 1) measurements on RF Channel 1		‘0001000000010000000100000001000000010000’	Time domain measurement resource restriction pattern for PCell measurement signalled to the UE in measSubframePatternPCell. The IE MeasSubframePattern is used to specify the time domain measurement resource restriction as defined in TS 36.331 [5], clause 6.3.6. Configured for Cell 1 measurements.
Time domain measurement resource restriction pattern for neighbour cell (Cell 2) measurements on RF Channel 1		‘0100000010000000100000000010000001000000’	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh The IE MeasSubframePattern is used to specify the time domain measurement resource restriction as defined in TS 36.331 [5], clause 6.3.6. Configured for Cell 2 measurements.
Note 1: Applies to restricted measurement subframes of the respective cell.			

9.2.9.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2.A.3.

2. Set the parameters according to Table 9.2.9.1.5-1 and 9.2.9.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.9.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.9.1.5-1 as appropriate.

9.2.9.1.4.3 Message contents

Table 9.2.9.1.4.3-1: Common Exception messages for RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4 Table H.3.5-5

Table 9.2.9.1.4.3-2: *MeasResults*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.9.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.9.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	‘0001000000010000000100000001000000010000’	BIT STRING (SIZE (40))	
}			
}			
}			

Table 9.2.9.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternFDD-r10	‘0100000010000000100000000010000001000000’	BIT STRING (SIZE (40))	
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.2.9.1.4.3-6: *SystemInformationBlockType2*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		Cell 2
}			

Table 9.2.9.1.4.3-7: *SystemInformationBlockType3*: Additional RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		Cell 1
	‘00’B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.2.9.1.5 Test requirement

Table 9.2.9.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.9.1.5-2.

Table 9.2.9.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD RSRQ intra frequency test parameters under time domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
OCNG Patterns defined in D.1.8 (OP.8 FDD) and D.1.6 (OP.6 FDD) [Note5]			OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD	OP.8 FDD	OP.6 FDD
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PBCH_RA		dB	Note 6	0	Note 6	0	Note 6	0
PBCH_RB								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA [Note1]								
OCNG_RB [Note1]								
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F [Note 8]						-114	
	Bands FDD_G						-113	
	Bands FDD_H						-112.5	
CRS $\hat{E}_s/N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $\left(\hat{E}_s/I_{ot}\right)_{meas}$ [Note5, Note 7] in the 1st OFDM symbol		dB	2.55	-7.39	2.55	-7.39	3.25	-9.39
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ [note 5] in OFDM symbols 4,7,11		dB	2.55	-1.2	2.55	-1.2	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP [Note3,4,5]	Bands FDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands FDD_C						-110	-118.05
	Bands FDD_D						-109.5	-117.55
	Bands FDD_E, FDD_F [Note 8]						-109	-117.05
	Bands FDD_G						-108	-116.05
	Bands FDD_H						-107.5	-115.55
$(RSRQ)_{meas}$ [Note3,4,5]	Bands FDD_A	dB	-12.71	-14.54	-12.71	-14.54	-12.47	-15.70
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 8]							
	Bands FDD_G							
	Bands FDD_H							
$(Io)_{meas}$ [Note3] 1st OFDM symbol	Bands FDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.55	-85.20
	Bands FDD_C						-80.55	-84.20
	Bands FDD_D						-80.05	-83.70
	Bands FDD_E, FDD_F [Note 8]						-79.55	-83.20
	Bands FDD_G						-78.55	-82.20
	Bands FDD_H						-78.05	-81.70
$(Io)_{meas}$ [Note3] OFDM	Bands FDD_A	dBm/9 MHz	-51.06	-55.53	-69.15	-73.62	-81.54	-86.47
	Bands FDD_C						-80.54	-85.47

symbols other than the 1st one	Bands FDD_D						-80.04	-84.97
	Bands FDD_E, FDD_F Note 8						-79.54	-84.47
	Bands FDD_G						-78.54	-83.47
	Bands FDD_H						-78.04	-82.97
Propagation condition		-	AWGN		AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: Applies to restricted measurement subframes of the respective cell. Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1. Note 7: In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS 36.133 [4] 9.1.5.2. Note 8: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 9: E-UTRA operating band groups are as defined in Section 3.5.								

Table 9.2.9.1.5-2: RSRQ FDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.10 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS

9.2.10.1 TDD RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)

9.2.10.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with MBSFN ABS is within the specified limits for all bands.

9.2.10.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support of FGI bit 115

9.2.10.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.10.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern.

Table 9.2.10.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with MBSFN ABS

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 2 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 4	dBm/BW$_{Channel}$
±2.5	±4	≥-2 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-4 dB	Note 3	Note 3	Note 3

NOTE 1: This minimum Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The Io range defined by the minimum and the maximum Io levels applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.10.1.3-2.

Table 9.2.10.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.2 and A.9.2.10.

9.2.10.1.4 Test description

9.2.10.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. The general test parameter settings are set up according to Table 9.2.10.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.9.1.4.3.

5. Cell 1 is the serving cell as well as aggressor cell to Cell 2, Cell 2 is the neighbouring cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.2.10.1.4.1-1: General test parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time-domain measurement resource restriction with MBSFN ABS

Parameter	Unit	Value	Comment
Serving cell (PCell)		Cell 1	The aggressor cell to Cell 2
Neighbour cell		Cell 2	Cell to be measured
E-UTRA RF Channel Number		1	One TDD carrier frequency is used
Channel Bandwidth ($BW_{channel}$)	MHz	10	For both cells in the test
PCell ABS configuration		MBSFN ABS	As defined in Table C.3.1.2.1-1
Special subframe configuration		6	For Cell 1 and Cell 2. For special subframe configurations see Table 4.2-1 in [16].
Uplink/downlink subframe configuration		1	For Cell 1 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in [16].
CP length		Normal	For both cells in the test
DRX			OFF
Time offset between cells		3 µs	Synchronous cells
Physical cell ID PCI		(PCI_{cell1} - PCI_{cell2})mod6 =0 PCI_{cell1} not equal to PCI_{cell2}	Cell PCIs for Cell 1 and Cell 2 are selected randomly so that the condition is met
ABS pattern		'00001000000000100000'	MBSFN ABS pattern. TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. Configured in Cell 1. The first/leftmost bit corresponds to the subframe #0 of a radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. All ABS subframes are MBSFN subframes.
Time-domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1		'00001000000000100000'	Configured for Cell 2 measurements by measSubframePattern-Neigh IE in measSubframePatternConfig-Neigh, as defined in TS 36.331 [5], clause 6.3.5. measSubframeCellList contains Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements		'10000000001000000000'	Configured for measurements on Cell 1.

9.2.10.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3..

2. Set the parameters according to Table 9.2.9.1.5-1 and 9.2.9.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ values according to Table 9.2.10.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved.

9.2.10.1.4.3 Message contents

Table 9.2.10.1.4.3-1: Common Exception messages for RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.10.1.4.3-2: *MeasResults*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.10.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.10.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

Table 9.2.10.1.4.3-5: *MeasObjectEUTRA-GENERIC(Freq)*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measSubframePatternConfigNeigh-r10 CHOICE {			
setup SEQUENCE {			
measSubframePatternNeigh-r10 CHOICE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'00001000000000100000'	BIT STRING (SIZE (20))	
}			
}			
measSubframeCellList-r10 SEQUENCE {			
start	Physical Cell ID of Cell 2		
range	Not present		
}			
}			
}			
}			

Table 9.2.10.1.4.3-6: *SystemInformationBlockType2*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: Clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
mbsfn-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF SEQUENCE {			Cell 1
radioframeAllocationPeriod	n1	Every radio frame is with MBSFN subframe	
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'010000'B	Subframe 4 is used for MBSFN	
}			
}			

Table 9.2.10.1.4.3-7: *SystemInformationBlockType3*: Additional RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'00'B (Not all neighbour cells have the same MBSFN subframe allocation as serving cell)		Cell 2

9.2.10.1.5 Test requirement

Table 9.2.10.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.10.1.5-2.

Table 9.2.10.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD RSRQ intra frequency test parameters under time domain measurement resource restriction with MBSFN ABS

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.5 (OP.5 TDD) and D.2.2 (OP.2 TDD)			OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD	OP.5 TDD	OP.2 TDD
PBCH_RA PBCH_RB PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note1] OCNG_RB[Note1]		dB	Note 6	0	Note 6	0	Note 6	0
PSS_RA		dB	-4	0	-4	0	-4	0
SSS_RA		dB	-4	0	-4	0	-4	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-85.76		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
CRS $\hat{E}_s/N_{oc}$		dB	5	-1.2	5	-1.2	5	-3.05
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ Note 5 In the 1st OFDM symbol		dB	2.55	-7.39	2.55	-7.39	3.25	-9.39
CRS $\left(\hat{E}_s/Iot\right)_{meas}$ note 5 in OFDM symbols 4,7,11		dB	2.55	-1.2	2.55	-1.2	3.25	-3.05
SCH $\hat{E}_s/I_{ot}$		dB	-1.45	-4.74	-1.45	-4.74	-0.75	-6.59
RSRP Note 3,4,5	Bands TDD_A	dBm/15 kHz	-80.76	-86.96	-98.85	-105.05	-111	-119.05
	Bands TDD_C						-110	-118.05
	Bands TDD_E						-109	-117.05
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	-12.71	-14.54	-12.71	-14.54	-12.47	-15.70
$(\mathrm{Io})_{meas}$ Note3 in the 1st OFDM symbol	Bands TDD_A	dBm/9 MHz	-51.06	-54.39	-69.15	-72.48	-81.55	-85.20
	Bands TDD_C						-80.55	-84.20
	Bands TDD_E						-79.55	-83.20
$(\mathrm{Io})_{meas}$ Note3 in OFDM symbols other than the 1st one	Bands TDD_A	dBm/9 MHz	-51.06	-55.53	-69.15	-73.62	-81.54	-86.47
	Bands TDD_C						-80.54	-85.47
	Bands TDD_E						-79.54	-84.47
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes of the respective cell.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.2.1-1.
Note 7:	In the 1st OFDM symbol, Cell 2 is not expected to meet the Es/Iot side condition in TS 36.133 [4] 9.1.5.2.

Table 9.2.10.1.5-2: RSRQ TDD Intra frequency under time domain measurement resource restriction with MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_04	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_01	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_19	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%

9.2.11 FDD RSRQ for E-UTRA Carrier Aggregation for 20MHz

9.2.11.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.11.1.1 Test purpose

To verify that FDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions for 20MHz. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.11.1.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.11.1.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The FDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.11.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.11.1.3-1: FDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.11.1.3-2.

Table 9.2.11.1.3-2: FDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.11.

9.2.11.1.4 Test description

9.2.11.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.11.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.11.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.11.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.11.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.11.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.11.1.5 Test requirement

Table 9.2.11.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.11.1.5-2.

Table 9.2.11.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD	R.10 FDD	R.10 FDD
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-87.26	-82.67	
	Bands FDD_C Note 5		-86.26	-81.67	
	Bands FDD_D Note 5		-85.76	-81.17	
	Bands FDD_E Note 5		-85.26	-80.67	
	Bands FDD_G Note 5		-84.26	-79.67	
	Bands FDD_H Note 5		-83.76	-79.17	

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.2.5.2.5-1 for the other parameters.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.
NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.

Table 9.2.11.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.11.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.11.2.1 Test purpose

To verify that FDD relative RSRQ measurement accuracy in carrier aggregation for 20MHz is within the specified limits under AWGN propagation conditions. This test will verify the FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.11.2.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA FDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.11.2.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.11.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.11.2.3-1: FDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.11.2.3-2.

Table 9.2.11.2.3-2: FDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.11.

9.2.11.2.4 Test description

9.2.11.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.11.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.11.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.11.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each

MeasurementReport message according to Table 9.2.11.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.11.2.4.3 Message contents

Table 9.2.11.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.11.2.5 Test requirement

Table 9.2.11.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.11.2.5-2.

Table 9.2.11.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation

Parameters	Test 1			
	Units	Cell 1	Cell 2	Cell 3

$BW_{channel\_CA}$ Note 1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.1			R.4 FDD	R.4 FDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.10 FDD	R.10 FDD	R.10 FDD
OCNG Patterns defined in D.1.11 (OP.11 FDD) and D.1.12 (OP.12 FDD)			OP.11 FDD	OP.11 FDD	OP.12 FDD
Io Note2	Bands FDD_A Note 5	dBm/18 MHz	-87.26	-82.67	
	Bands FDD_C Note 5		-86.26	-81.67	
	Bands FDD_D Note 5		-85.76	-81.17	
	Bands FDD_E Note 5		-85.26	-80.67	
	Bands FDD_G Note 5		-84.26	-79.67	
	Bands FDD_H Note 5		-83.76	-79.17	
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.2.5.2.5-1 for the other parameters. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5. NOTE 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.2.12.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.12 TDD RSRQ for E-UTRA Carrier Aggregation for 20MHz

9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.12.1.1 Test purpose

To verify that TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions for 20MHz. This test will verify the TDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carrier.

9.2.12.1.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.12.1.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The TDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.12.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.12.1.3-1: TDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.12.1.3-2.

Table 9.2.12.1.3-2: TDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.12.

9.2.12.1.4 Test description

9.2.12.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.12.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.12.1.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.12.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, The SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.12.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.12.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.12.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.12.1.5 Test requirement

Table 9.2.12.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.12.1.5-2.

Table 9.2.12.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz

<table>
<tr><th rowspan="2" colspan="2">Parameters</th><th colspan="4">Test 1</th></tr>
<tr><th>Units</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">$BW_{channel\_CA}$ Note1</td><td>MHz</td><td>20</td><td>20</td><td>20</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>47-52</td><td>47-52</td><td>47-52</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.2</td><td></td><td>R.3 TDD</td><td>R.3 TDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>38-61</td><td>38-61</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td>R.10 TDD</td><td>R.10 TDD</td><td>R.10 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)</td><td></td><td>OP.7 TDD</td><td>OP.7 TDD</td><td>OP.8 TDD</td></tr>
<tr><td rowspan="3">Io Note2</td><td>Bands TDD_A Note 5</td><td rowspan="3">dBm/18 MHz</td><td>-87.26</td><td colspan="2">-82.60</td></tr>
<tr><td>Bands TDD_C Note 5</td><td>-86.26</td><td colspan="2">-81.60</td></tr>
<tr><td>Bands TDD_E Note 5</td><td>-85.26</td><td colspan="2">-80.60</td></tr>
<tr><td colspan="6">Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.</td></tr>
</table>

Table 9.2.12.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz

9.2.12.2.1 Test purpose

To verify that TDD relative RSRQ measurement accuracy in carrier aggregation for 20MHz is within the specified limits under AWGN propagation conditions. This test will verify the TDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.12.2.2 Test applicability

This test case applies to all types of E-UTRA TDD UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA TDD UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.12.2.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.12.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.

$$\left|RSRP1|_{dBm} - RSRP2|_{dBm}\right| \le [27]dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.12.2.3-1: TDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.12.2.3-2.

Table 9.2.12.2.3-2: TDD RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.12.

9.2.12.2.4 Test description

9.2.12.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 20 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.12.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.12.2.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 the SCell on the Secondary Component Carrier (SCC), and Cell 3 the neighbouring cell on the SCC. The SCell (Cell 2) and neighbouring cell (Cell 3) on the SCC are configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier compared with measurements of cells on the secondary component carrier,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.12.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. The SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.12.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.12.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.12.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation for 20MHz test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

9.2.12.2.5 Test requirement

Table 9.2.12.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation for 20MHz test shall meet the reported values test requirements in Table 9.2.12.2.5-2.

Table 9.2.12.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	20	20	20
Measurement bandwidth		n_{PRB}	47-52	47-52	47-52
PDSCH Reference measurement channel defined in A.1.2			R.3 TDD	R.3 TDD	-
PDSCH allocation		n_{PRB}	38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.10 TDD	R.10 TDD	R.10 TDD
OCNG Patterns defined in D.2.7 (OP.7 TDD) and D.2.8 (OP.8 TDD)			OP.7 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A Note 5	dBm/18 MHz	-87.26	-82.60	
	Bands TDD_C Note 5		-86.26	-81.60	
	Bands TDD_E Note 5		-85.26	-80.60	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in TS 36.133 [4] section A.3.6.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.6.2.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 20 MHz channel bandwidth.					

Table 9.2.12.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 20MHz

	Test 1

	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.13 Void

9.2.14 Void

9.2.15 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.2.15.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS within the specified limits.

9.2.15.1.2 Test applicability

This test applies to all types of E-UTRA FDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.2.15.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.15.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [5]) and the CRS assistance information is valid throughout the entire evaluation period.

Table 9.2.15.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 5	Io Note 2 range		
			E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 4	dBm/$BW_{Channel}$
±2.5	±4	≥-6.96	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-9.46	Note 3	Note 3	Note 3

NOTE 1: This Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: The gap between the Es/Iot level in TS36.133 [4] table 9.1.5.3-1 and TS36.133 [4] 9.1.5.2-1 is due to the interference from either PCell or at least one neighbour cell indicated within the CRS assistance information.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.15.1.3-2.

Table 9.2.15.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.3 and A.9.2.15.

9.2.15.1.4 Test description

9.2.15.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.2.15.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.15.1.4.3.

5. There is one E-UTRA FDD carrier and three cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.15.1.4.1-1: General test parameters for E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PCell			Cell 1	Serving/aggressor cell
Neighbour cells			Cell 2	Neighbour/aggressor cell
			Cell 3	Cell to be measured
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For all cells in the test
DRX				OFF
Time offset between cells		μs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
Physical cell IDs			$(PCI_{cell1} - PCI_{cell3})\text{mod}6 = 0$ $(PCI_{cell2} - PCI_{cell3})\text{mod}6 != 0$ PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'1000000010000000100000001000000010000000'	FDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (40) divided by 10. No MBSFN subframes are configured in the ABS subframes. Configured in Cell 1 and Cell 2.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'1000000010000000100000001000000010000000'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Configured for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'0100000001000000010000000100000001000000'	Configured for measurements on Cell 1.
CRS assistance information	physCellId		see PCI conditions above	Only the CRS information of Cell 2 is provided in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.2.15.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.2.15.1.4.1-1 and Table 9.2.15.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell 3 and non-colliding CRS between Cell1 and Cell 2. In all test cases, Cell 1 is the serving/aggressor cell, Cell 2 is the neighbour/aggressor cell and Cell 3 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN FDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Table 9.2.15.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 3 reported by the UE is compared to the actual RSRQ value according to Table 9.2.15.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.15.1.5-1 as appropriate.

9.2.15.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.2.15.1.4.3-1: Common Exception messages for E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.2.15.1.4.3-2: *MeasResults*: Additional E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.15.1.4.3-3: *MeasResultListEUTRA*: Additional E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.15.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternFDD-r10	‘01000000010000000100 00000100000001000000’	BIT STRING (SIZE (40))	
}			
}			
}			

9.2.15.1.5 Test requirement

Table 9.2.15.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.15.1.5-2.

Table 9.2.15.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22—27			22—27			22—27		
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-		R.0 FDD	-		R.0 FDD	-	
PDSCH allocation		n_{PRB}	13—36	-		13—36	-		13—36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD			R.6 FDD			R.6 FDD		
OCNG Patterns defined in D.1			OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6 FDD	OP.6 FDD	OP.5 FDD	OP.6FDD	OP.6 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note 1 OCNG_RB Note 1		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} Note 2	Bands FDD_A	dBm/15 kHz	-84.76			-103.85			-116		
	Bands FDD_C								-115		
	Bands FDD_D								-114.5		
	Bands FDD_E, FDD_F Note 7								-114		
	Bands FDD_G								-113		
	Bands FDD_H								-112.5		
CRS $\hat{E}_s/N_{oc}$		dB	4	2	-0.5	4	2	-0.5	4	2	-3
CRS $\left(\hat{E}_s/I_{ot}\right)_{meas}$ Note 5		dB	-1.41	-0.77	-5.96	-1.41	-0.77	-5.96	-0.89	0.24	-8.46
RSRP Note 3,4,5	Bands FDD_A	dBm/15 kHz	-80.76	-82.76	-85.26	-99.85	-101.85	-104.35	-112	-114	-119
	Bands FDD_C								-111	-113	-118
	Bands FDD_D								-110.5	-112.5	-117.5
	Bands FDD_E, FDD_F Note 7								-110	-112	-117
	Bands FDD_G								-109	-111	-116
	Bands FDD_H								-108.5	-110.5	-115.5
$(\mathrm{RSRQ})_{meas}$ Note 3,4,5	Bands FDD_A, FDD_C, FDD_D, FDD_E, FDD_F Note 7, FDD_G, FDD_H	dB	-14.56	-11.99	-14.49	-14.56	-11.99	-14.49	-14.27	-11.09	-16.09

$(\mathrm{Io})_{meas}$ Note 3	Bands FDD_A	dBm/9 MHz	-49.21	-52.87	-68.30	-71.96	-80.74	-84.83
	Bands FDD_C						-79.74	-83.83
	Bands FDD_D						-79.24	-83.33
	Bands FDD_E, FDD_F Note 7						-78.74	-82.83
	Bands FDD_G Note 9						-77.74	-81.83
	Bands FDD_H						-77.24	-81.33
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6: Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: Except Band 29 and Band 32.

Table 9.2.15.1.5-2: RSRQ FDD Intra frequency under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 3)	RSRQ_05	RSRQ_05	RSRQ_00
Highest reported value (Cell 3)	RSRQ_17	RSRQ_17	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 3)	RSRQ_02	RSRQ_02	RSRQ_00
Highest reported value (Cell 3)	RSRQ_20	RSRQ_20	RSRQ_17

9.2.16 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS

9.2.16.1 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)

9.2.16.1.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS within the specified limits.

9.2.16.1.2 Test applicability

This test applies to all types of E-UTRA TDD and CRS interference handling UE release 11 and forward. Applicability requires support of FGI bit 115.

9.2.16.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this section shall apply to a cell on the same frequency as that of the serving cell when a time domain measurement resource restriction pattern for performing RSRQ measurements of this cell is configured by higher layers according to TS 36.331 [5].

The accuracy requirements in Table 9.2.16.1.3-1 are valid under the following conditions:

Cell specific reference signals in the measured cell are transmitted either from one, two or four antenna ports,

Conditions defined in TS 36.101 [2] Section 7.3 for reference sensitivity are fulfilled,

$RSRP|_{dBm}$ according to Annex I.3.9 for a corresponding Band,

The time domain measurement resource restriction pattern configured for the measured cell indicates at least one subframe per radio frame for performing the RSRQ measurement,

The RSRQ measurement is not performed in any subframe other than those indicated by the time domain measurement resource restriction pattern configured for the measured cell,

Four symbols containing CRS are available in all subframes indicated by the time domain measurement resource restriction pattern,

The UE is provided with the CRS assistance information (TS 36.331 [5]) and the CRS assistance information is valid throughout the entire evaluation period.

Table 9.2.16.1.3-1: RSRQ Intra frequency absolute accuracy under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Accuracy		Conditions			
			Io Note 2 range		
Normal condition	Extreme condition	Ês/Iot Note 5	E-UTRA operating band groups Note 6	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 1, 4	$dBm/BW_{Channel}$
±2.5	±4	≥-6.96	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-9.46	Note 3	Note 3	Note 3

NOTE 1: This Io condition is expressed as the average Io per RE over all REs in that symbol.
NOTE 2: Io is defined in subframes indicated by the time domain measurement resource restriction pattern configured for performing RSRQ measurements of this cell. The specified Io range applies to CRS and non-CRS symbols. Io may be different in different symbols within a subframe.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: The gap between the Es/Iot level in TS36.133[4] table 9.1.5.3-1 and TS36.133[4] 9.1.5.2-1 is due to the interference from either PCell or at least one neighbour cell indicated within the CRS assistance information.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.16.1.3-2.

Table 9.2.16.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.3 and A.9.2.16.

9.2.16.1.4 Test description

9.2.16.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.54 (without faders).

2. The general test parameter settings are set up according to Table 9.2.16.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.2.16.1.4.3.

5. There is one E-UTRA TDD carrier and three cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 9.2.16.1.4.1-1: General test parameters for E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Value	Comment
PCell			Cell 1	Serving/aggressor cell
Neighbour cells			Cell 2	Neighbour/aggressor cell
			Cell3	Cell to be measured
Special subframe configuration			6	For Cell 1, Cell 2 and Cell 3. For special subframe configurations see Table 4.2-1 in 36.211 [9].
Uplink/downlink subframe configuration			1	For Cell 1, Cell 2 and Cell 2. For uplink-downlink subframe configurations see Table 4.2-2 in TS 36.211 [9].
ABS transmission configuration			Non-MBSFN ABS	As defined in Table C.3.1.1.1-1
CP length			Normal	For all cells in the test
DRX				OFF
Time offset between cells		μs	Cell 2 offset with respect to Cell 1: 0 Cell 3 offset with respect to Cell 1: -2.5	Three synchronous cells
Physical cell IDs			$(PCI_{cell1} - PCI_{cell3})mod6 = 0$ $(PCI_{cell2} - PCI_{cell3})mod6 != 0$ PCI_{cell1} not equal to PCI_{cell3}	Cell PCIs are selected so that all conditions are met
ABS pattern			'00000000010000000001'	TDD ABS Pattern Info IE, as defined in TS 36.423 [28], clause 9.2.54. The first/leftmost bit corresponds to the Pcell subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string (20) divided by 10. No MBSFN subframes are configured in the ABS subframes. Provided to the UE for Cell 1 and Cell 2.
Time domain measurement resource restriction pattern for neighbour cell measurements on RF Channel 1			'00000000010000000001'	Time domain measurement resource restriction pattern for neighbour cell measurement signalled to the UE in measSubframePatternNeigh IE in measSubframePatternConfigNeigh, as defined in TS 36.331, clause 6.3.5. Provided to the UE for Cell 3 measurements. The cell list in measSubframeCellList IE shall contain Cell 3 but not Cell 2.
Time-domain measurement resource restriction pattern for serving cell measurements			'10000000001000000000'	Configured for Cell 1 measurements.
CRS assistance information	physCellId		see PCI conditions above	Only the CRS assistance information of cell 2 is provided for Cell 2 only in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000'.
	antennaPortsCount		1	
	mbsfn-SubframeConfigList		*oneFrame* = '000000'	

9.2.16.1.4.2 Test procedure

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurements under time domain measurement resource restriction with CRS assistance information is tested by using the parameters in Table 9.2.16.1.4.1-1 and Table.9.2.16.1.5-1 for non-MBSFN ABS with colliding CRS between Cell 1 and Cell3 and non-colliding CRS between Cell 1 and Cell 2. In all test cases, Cell 1 is the serving/aggressor cell, Cell 2 is the neighbour/aggressor cell and Cell 3 is the target cell to be measured for RSRQ.

The UE is configured by higher layers via Cell 1 with a time domain measurement resource restriction pattern for performing E-UTRAN TDD intra-frequency measurements on neighbour cells, namely Cell 3 measurements with a neighbour cell list, where the cell list includes Cell 3. The UE is also provided via higher layers with the CRS assistance information of Cell 2. The information for both measurement pattern and the CRS assistance information shall be provided to the UE before the measurements start.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3 with exceptions listed in 7.2A.6.

2. Set the parameters according to Table 9.2.16.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 3 reported by the UE is compared to the actual RSRQ value according to Table 9.2.16.1.5-2. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.16.1.5-1 as appropriate.

9.2.16.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 7.2A.6 with the following exceptions:

Table 9.2.16.1.4.3-1: Common Exception messages for E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.7-1 Table H.2.7-2
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4a Table H.3.5-5 Table H.5.1-1 Table H.5.1-2 Table H.5.1-3

Table 9.2.16.1.4.3-2: *MeasResults*: Additional E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.16.1.4.3-3: *MeasResultListEUTRA*: Additional E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.331 [5] clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity of Cell 3		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

Table 9.2.16.1.4.3-4: *RadioResourceConfigDedicated-SRB2-DRB(n,m)*: Additional E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16 RadioResourceConfigDedicated-SRB2-DRB(n,m)			
Information Element	**Value/remark**	**Comment**	**Condition**
RadioResourceConfigDedicated-SRB2-DRB(n, m) ::= SEQUENCE {			
MeasSubframePatternPCell-r10 CHOICE {			
setup SEQUENCE {			
subframePatternTDD-r10 CHOICE {			
subframeConfig1-5-r10	'10000000001000000000'	BIT STRING (SIZE (20))	
}			
}			
}			
}			

9.2.16.1.5 Test requirement

Table 9.2.16.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 9.2.16.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD RSRQ intra frequency under time-domain measurement resource restriction with CRS assistance information and non-MBSFN ABS

Parameter		Unit	Test 1			Test 2			Test 3		
			Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1			1			1		
$BW_{channel}$		MHz	10			10			10		
Measurement bandwidth		n_{PRB}	22-27			22-27			22-27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-		R.0 TDD	-		R.0 TDD	-	
PDSCH allocation		n_{PRB}	13-36	-		13—36	-		13-36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD			R.6 TDD			R.6 TDD		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	Note 6	Note 6	0	Note 6	Note 6	0	Note 6	Note 6	0
N_{oc} Note2	Bands TDD_A	dBm/15 kHz	-84.76			-103.85			-116		
	Bands TDD_C								-115		
	Bands TDD_E								-114		
CRS $\hat{E}_s/N_{oc}$		dB	4	2	-0.5	4	2	-0.5	4	2	-3
CRS $(\hat{E}_s/I_{ot})_{meas}$ Note 5		dB	-1.41	-0.77	-5.96	-1.41	-0.77	-5.96	-0.89	0.24	-8.46
RSRP Note3,4,5	Bands TDD_A	dBm/15 kHz	-80.76	-82.76	-85.26	-99.85	-101.85	-104.35	-112	-114	-119
	Bands TDD_C								-111	-113	-118
	Bands TDD_E								-110	-112	-117
$(\mathrm{RSRQ})_{meas}$ Note3,4,5	Bands TDD_A, TDD_C, TDD_E	dB	-14.56	-11.96	-14.49	-14.56	-11.99	-14.49	-14.27	-11.09	-16.09
$(\mathrm{Io})_{meas}$ Note3	Bands TDD_A	dBm/9 MHz	-49.21	-52.87		-68.30	-71.96		-80.74	-84.83	
	Bands TDD_C								-79.74	-83.83	
	Bands TDD_E								-78.74	-82.83	
Propagation condition		-	AWGN			AWGN			AWGN		

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Applies to all subframes.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io levels are calculated in CRS symbols of measurement restricted subframes.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Applies to restricted measurement subframes for only Cell 2 and Cell 3. For Cell 1, the corresponding value is derived from the normal subframes other than the subframes indicated in the time domain measurement resource restriction pattern for intra-frequency measurements.
Note 6:	Non-ABS and ABS subframe channel powers defined in Table C.3.1.1.1-1.
Note 7:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.16.1.5-2: RSRQ TDD Intra frequency under time domain measurement resource restriction with CRS assistance information and non-MBSFN ABS absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 3)	RSRQ_05	RSRQ_05	RSRQ_00
Highest reported value (Cell 3)	RSRQ_17	RSRQ_17	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 3)	RSRQ_02	RSRQ_02	RSRQ_00
Highest reported value (Cell 3)	RSRQ_20	RSRQ_20	RSRQ_17

9.2.17 FDD Intra frequency RSRQ Accuracy for 5MHz Bandwidth

9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth

9.2.17.1.1 Test purpose

To verify that the FDD intra frequency absolute RSRQ measurement accuracy for 5MHz Bandwidth is within the specified limit.

9.2.17.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support Band 31. Applicability requires support for FGI bit 16.

9.2.17.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.17.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.17.1.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.17.1.3-2.

Table 9.2.17.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1 and A.9.2.17.

9.2.17.1.4 Test description

9.2.17.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.2.1.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.2.17.1.4.2 Test procedure

Same test procedure as defined in clause 9.2.1.1.4.2 with the following exceptions:

- Instead of Table 9.2.1.1.5-2 → use Table 9.2.17.1.5-1.
- Instead of Table 9.2.2.1.5-3 → use Table 9.2.17.1.5-2.

9.2.17.1.4.3 Message contents

Same message contents as defined in clause 9.2.1.1.4.3.

9.2.17.1.5 Test requirement

Table 9.2.17.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.17.1.5-2.

Table 9.2.17.1.5-1: RSRQ FDD Intra frequency absolute accuracy test parameters for 5MHz Bandwidth

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	5		5		5	
Measurement bandwidth		n_{PRB}	10-15		10-15		10-15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7-17	-	7-17	-	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Band 31	dBm/15 kHz	-82.81		-100.85		-109.5	
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.70	-4.70	-5.17	-5.17
RSRP Note3	Band 31	dBm/15 kHz	-79.81	-79.81	-103.75	-103.75	-113.10	-113.10
RSRQ Note3	Band 31	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io Note3	Band 31	dBm/4.5 MHz	-51.06		-73.01		-82.00	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.17.1.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	**Test 2**	**Test 3**
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.18 FDD - FDD Inter frequency RSRQ Accuracy for 5MHz Bandwidth

9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth

9.2.18.1.1 Test purpose

To verify that the FDD - FDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for band 31.

9.2.18.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support Band 31. Applicability requires support for FGI bits 16 and 25.

9.2.18.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.2.18.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.3 for a corresponding Band.

Table 9.2.18.1.3-1: RSRQ Inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.13.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1, clause 9.1.7 and A.9.2.18.

9.2.18.1.4 Test description

9.2.18.1.4.1 Initial conditions

Same initial conditions as defined in clause 9.2.3.1.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.2.18.1.4.2 Test procedure

Same test procedure as defined in clause 9.2.3.1.4.2 with the following exceptions:

- Instead of Table 9.2.3.1.5-2 → use Table 9.2.18.1.5-1.
- Instead of Table 9.2.3.1.5-3 → use Table 9.2.18.1.5-2.

9.2.18.1.4.3 Message contents

Same message contents as defined in clause 9.2.3.1.4.3.

9.2.18.1.5 Test requirement

Table 9.2.18.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.18.1.5-2.

Table 9.2.18.1.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	5	5	5	5	5	5
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7—17	-	7—17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-77.0	-78.1	-101.70	-101.70	-119.5	N/A
	Bands FDD_C						-118.5	N/A
	Bands FDD_D						-118.0	N/A
	Bands FDD_E, FDD_F Note 5						-117.5	N/A
	Bands FDD_G						-116.5	N/A
	Bands FDD_H						-116.0	N/A
	Bands FDD_N						- N/A	-112.7
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.00	-3.20	-4.00	-3.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-78.75	-79.85	-105.70	-104.90	-123.5	N/A
	Bands FDD_C						-122.5	N/A
	Bands FDD_D						-122.0	N/A
	Bands FDD_E, FDD_F Note 5						-121.5	N/A
	Bands FDD_G						-120.5	N/A
	Bands FDD_H						-120.0	N/A
	Bands FDD_N						N/A	-115.9
RSRQ Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 5 Bands FDD_G Bands FDD_H Bands FDD_N	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
Io Note3	Bands FDD_A	dBm/4.5 MHz	-50.01	-51.11	-75.47	-75.23	-93.27	N/A
	Bands FDD_C						-92.27	N/A
	Bands FDD_D						-91.77	N/A
	Bands FDD_E, FDD_F Note 5						-91.27	N/A
	Bands FDD_G						-90.27	N/A
	Bands FDD_H						-89.77	N/A
	Bands FDD_N						N/A	-86.23

$\hat{E}_s/N_{oc}$	dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition	-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6: This test is only applicable for testing inter-frequency requirements for Band 31. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE.
Note 7: E-UTRA operating band groups are as defined in section 3.5.

Table 9.2.18.1.5-2: RSRQ FDD - FDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_17	RSRQ_17

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.18.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ for 5MHz Bandwidth

9.2.18.2.1 Test purpose

To verify that the FDD - FDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for band 31.

9.2.18.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support Band 31. Applicability requires support for FGI bits 16 and 25.

9.2.18.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.2.18.2.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex B.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27 dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.18.2.3-1: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.13.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2, clause 9.1.7 and A.9.2.18.

9.2.18.2.4 Test description

9.2.18.2.4.1 Initial conditions

Same initial conditions as defined in clause 9.2.3.2.4.1 with the exception that the Channel Bandwidth to be tested is 5MHz.

9.2.18.2.4.2 Test procedure

Same test procedure as defined in clause 9.2.3.2.4.2 with the following exceptions:

- Instead of Table 9.2.3.2.5-2 → use Table 9.2.18.2.5-1.
- Instead of Table 9.2.3.2.5-3 → use Table 9.2.18.2.5-2.

9.2.18.2.4.3 Message contents

Same message contents as defined in clause 9.2.3.2.4.3.

9.2.18.2.5 Test requirement

Table 9.2.18.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.18.2.5-2.

Table 9.2.18.2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency relative accuracy for 5MHz bandwidth

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	5	5	5	5	5	5
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	10—15		10—15		10—15	
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	-	R.5 FDD	-	R.5 FDD	-
PDSCH allocation		n_{PRB}	7—17	-	7—17	-	7—17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD		R.11 FDD		R.11 FDD	
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD	OP.15 FDD	OP.16 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
N_{oc} [Note2]	Bands FDD_A	dBm/15 kHz	-78.1	-78.1	-101.70	-101.70	-119.5	N/A
	Bands FDD_C						-118.5	N/A
	Bands FDD_D						-118.0	N/A
	Bands FDD_E, FDD_F [Note 5]						-117.5	N/A
	Bands FDD_G						-116.5	N/A
	Bands FDD_H						-116.0	N/A
	Bands FDD_N						- N/A	-112.7
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.00	-3.20	-4.00	-3.20
RSRP[Note3]	Bands FDD_A	dBm/15 kHz	-79.85	-79.85	-105.70	-104.90	-123.5	N/A
	Bands FDD_C						-122.5	N/A
	Bands FDD_D						-122.0	N/A
	Bands FDD_E, FDD_F [Note 5]						-121.5	N/A
	Bands FDD_G						-120.5	N/A
	Bands FDD_H						-120.0	N/A
	Bands FDD_N						N/A	-115.9
RSRQ[Note3]	Bands FDD_A	dB	-14.76	-14.76	-16.25	-15.69	-16.25	-15.69
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F [Note 5]							
	Bands FDD_G							
	Bands FDD_H							
	Bands FDD_N							
Io[Note3]	Bands FDD_A	dBm/4.5 MHz	-51.11	-51.11	-75.47	-75.23	-93.27	N/A
	Bands FDD_C						-92.27	N/A
	Bands FDD_D						-91.77	N/A
	Bands FDD_E, FDD_F [Note 5]						-91.27	N/A
	Bands FDD_G						-90.27	N/A
	Bands FDD_H						-89.77	N/A
	Bands FDD_N						N/A	-86.23

$\hat{E}_s/N_{oc}$	dB	-1.75	-1.75	-4.0	-3.2	-4.0	-3.2
Propagation condition	-	AWGN		AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: This test is only applicable for testing inter-frequency requirements for Band 31. Cell 2 is on the Band under test, and Cell 1 is on another band supported by the UE. Note 7: E-UTRA operating band groups are as defined in section 3.5.							

Table 9.2.18.2.5-2: RSRQ FDD inter frequency relative accuracy requirements for 5MHz bandwidth for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 8	RSRQ_x + 11	RSRQ_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 9	RSRQ_x - 9
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 11	RSRQ_x + 11
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.19 FDD-FDD Inter Frequency WB-RSRQ

9.2.19.1 FDD-FDD Inter Frequency absolute WB-RSRQ accuracy

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

Exceptions for Message contents are FFS

The Test Tolerances and test requirements are undefined

9.2.19.1.1 Test purpose

To verify that the RSRQ measurement accuracy is within the specified limits when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. In the test the UE shall also be configured with the *AllowedMeasBandwidth* parameter defined in TS 36.331 [5]. The test shall verify the WB-RSRQ inter frequency absolute accuracy requirements.

9.2.19.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 11 and forward that support WB-RSRQ measurement. Applicability requires support for FGI bits 16 and 25.

9.2.19.1.3 Minimum conformance requirements

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. The WB-RSRQ accuracy figures in Table 9.2.19.1.3-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [5].

The accuracy requirements in Table 9.2.19.1.3-1 are valid under the following conditions:

The value of the parameter, *AllowedMeasBandwidth* in TS 36.331 [5], is 50 resource blocks or larger

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band.

Table 9.2.19.1.3-1: WB-RSRQ Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot Note 3	Io1-Io2 Note 2	Io range Note 1		
				E-UTRA operating band groups Note 6	Minimum Io Note 5	Maximum Io
dB	dB	dB	dB		dBm/15kHz	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	0 ≤Io1-Io2	FDD_A, TDD_A	-121	-50
				FDD_C, TDD_C	-120	-50
				FDD_D	-119.5	-50
				FDD_E, TDD_E	-119	-50
				FDD_F	-118.5	-50
				FDD_G	-118	-50
				FDD_H	-117.5	-50
				FDD_N	-114.5	-50
±3.5	±4	≥-6 dB		Note 4	Note 4	Note 4

NOTE 1: Io is the average across all the resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5].
NOTE 2: Io1 is the Io level in the resource blocks other than central 6 resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5] and Io2 is the Io level in central 6 resource blocks. The Io1 and Io2 have the same range as defined for Io.
NOTE 3: Iot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.19.1.3-2.

Table 9.2.19.1.3-2: FDD WB-RSRQ absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.3 and A.9.2.19.

9.2.19.1.4 Test description

9.2.19.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.19.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.19.1.4.2 Test procedure

The test consists of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of WB-RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.19.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.19.1.5-1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.19.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

FFS

9.2.19.1.5 Test requirement

Table 9.2.19.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD WB-RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.19.1.5-2.

Table 9.2.19.1.5-1: WB-RSRQ FDD-FDD Inter frequency test parameters

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Test 1</th></tr>
<tr><th>Cell 1</th><th colspan="2">Cell 2</th></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td colspan="2">2</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td>MHz</td><td>10</td><td colspan="2">10</td></tr>
<tr><td colspan="2">Antenna Configuration</td><td></td><td>1x2</td><td colspan="2">1x2</td></tr>
<tr><td colspan="2">Gap Pattern Id</td><td></td><td>0</td><td colspan="2">-</td></tr>
<tr><td colspan="2">PBCH_RA</td><td rowspan="13">dB</td><td rowspan="13">0</td><td colspan="2">0</td></tr>
<tr><td colspan="2">PBCH_RB</td><td colspan="2">0</td></tr>
<tr><td colspan="2">PSS_RA</td><td colspan="2">0</td></tr>
<tr><td colspan="2">SSS_RA</td><td colspan="2">0</td></tr>
<tr><td colspan="2">PCFICH_RB</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">PHICH_RA</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">PHICH_RB</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">PDCCH_RA</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">PDCCH_RB</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">PDSCH_RA</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">PDSCH_RB</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">OCNG_RA^Note1</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">OCNG_RB^Note1</td><td colspan="2">-∞</td></tr>
<tr><td colspan="2">AllowedMeasBandwidth in TS 36.331 [2]</td><td>RB</td><td>6</td><td colspan="2">50</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.3.1.1.1</td><td></td><td>R.0 FDD</td><td colspan="2">-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13-36</td><td colspan="2">-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1</td><td></td><td>R.6 FDD</td><td colspan="2">-</td></tr>
<tr><td colspan="2">OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)</td><td></td><td>OP.1 FDD</td><td colspan="2">-</td></tr>
<tr><td rowspan="2">I_{ot} Note2</td><td>bandwidth</td><td>n_{PRB}</td><td>0-49</td><td>0-21
28-49</td><td>22-27</td></tr>
<tr><td></td><td>dBm/15 kHz</td><td>-94 + TT</td><td>-87</td><td>-110 + TT</td></tr>
<tr><td rowspan="2">$\hat{E}_s/I_{ot}$</td><td>bandwidth</td><td>n_{PRB}</td><td>0-49</td><td>0-21
28-49</td><td>22-27</td></tr>
<tr><td></td><td>dB</td><td>-4 + TT</td><td>-3 + TT</td><td>20 + TT</td></tr>
<tr><td colspan="2">RSRP^Note3</td><td>dBm/15 kHz</td><td>-98</td><td colspan="2">-90</td></tr>
<tr><td colspan="2">RSRQ^Note3</td><td>dB</td><td>-16.25</td><td colspan="2">-</td></tr>
<tr><td colspan="2">$WB\text{-}RSRQ_0$^Note3 in subframe 0</td><td>dB</td><td>-</td><td colspan="2">-13.68</td></tr>
<tr><td colspan="2">$WB\text{-}RSRQ_1$^Note3 in subframe ≠ 0</td><td>dB</td><td>-</td><td colspan="2">-13.63</td></tr>
<tr><td colspan="2">Io^Note3</td><td>dBm/ 9 MHz</td><td>-64.76</td><td colspan="2">-</td></tr>
<tr><td colspan="2">Io^Note3 in symbol 0, 4, 11 of subframe 0</td><td>dBm/ 9 MHz</td><td>-</td><td colspan="2">-82.38</td></tr>
<tr><td colspan="2">Io^Note3 in symbol 7 of subframe 0</td><td>dBm/ 9 MHz</td><td>-</td><td colspan="2">-82.20</td></tr>
<tr><td colspan="2">Io^Note3 in symbol 0, 4, 7, 11 of subframes ≠ 0</td><td>dBm/ 9 MHz</td><td>-</td><td colspan="2">-82.38</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td>AWGN</td><td colspan="2">AWGN</td></tr>
<tr><td colspan="6">Note 1: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.
Note 3: RSRQ, RSRP, WB-RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the allowed measurement bandwidth, and the WB-RSRQ values assume averaging over symbols 0, 4, 7 and 11 of the subframe.
Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5: This test case is applicable to all FDD frequency bands except band 31.</td></tr>
</table>

Table 9.2.19.1.5-2: FDD WB-RSRQ accuracy for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS
Extreme Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.20 TDD-TDD Inter Frequency WB-RSRQ

9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

Exceptions for Message contents are FFS

The Test Tolerances and test requirements are undefined

9.2.20.1.1 Test purpose

To verify that the RSRQ measurement accuracy is within the specified limits when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. In the test the UE shall also be configured with the *AllowedMeasBandwidth* parameter defined in TS 36.331 [5]. The test shall verify the WB-RSRQ inter frequency absolute accuracy requirements.

9.2.20.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 11 and forward that support wideband RSRQ measurement. Applicability requires support for FGI bits 16 and 25.

9.2.20.1.3 Minimum conformance requirements

The requirements in this section shall apply when the measurement configuration message received by the UE contains *widebandRSRQ-Meas* parameter in TS 36.331 [5]. The WB-RSRQ accuracy figures in Table 9.2.20.1.3-1 are relative to the value that would be obtained by using the *AllowedMeasBandwidth* in TS 36.331 [5].

The accuracy requirements in Table 9.2.20.1.3-1 are valid under the following conditions:

The value of the parameter, *AllowedMeasBandwidth* in TS 36.331 [5], is 50 resource blocks or larger

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.1 for a corresponding Band.

Table 9.2.20.1.3-1: WB-RSRQ Inter frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot Note 3	Io1-Io2 Note 2	Io range Note 1		
				E-UTRA operating band groups Note 6	Minimum Io Note 5	Maximum Io
dB	dB	dB	dB		dBm/15kHz	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	0 ≤Io1-Io2	FDD_A, TDD_A	-121	-50
				FDD_C, TDD_C	-120	-50
				FDD_D	-119.5	-50
				FDD_E, TDD_E	-119	-50
				FDD_F	-118.5	-50
				FDD_G	-118	-50
				FDD_H	-117.5	-50
				FDD_N	-114.5	-50
±3.5	±4	≥-6 dB		Note 4	Note 4	Note 4

NOTE 1: Io is the average across all the resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5].
NOTE 2: Io1 is the Io level in the resource blocks other than central 6 resource blocks within the *AllowedMeasBandwidth* in TS 36.331 [5] and Io2 is the Io level in central 6 resource blocks. The Io1 and Io2 have the same range as defined for Io.
NOTE 3: Iot is the received power spectrum density of total interference and noise for all the resource blocks, other than central 6 resource blocks.
NOTE 4: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 5: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 6: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.20.1.3-2.

Table 9.2.20.1.3-2: TDD WB-RSRQ absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.3 and A.9.2.20.

9.2.20.1.4 Test description

9.2.20.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.20.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.20.1.4.2 Test procedure

The test consists of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of WB-RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.20.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.20.1.5-1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.20.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

FFS

9.2.20.1.5 Test requirement

Table 9.2.10.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD WB-RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.20.1.5-2.

Table 9.2.20.1.5-1: WB-RSRQ TDD-TDD Inter frequency test parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	
E-UTRA RF Channel Number			1	2	
$BW_{channel}$		MHz	10	10	
Special subframe configuration Note1			6	6	
Uplink-downlink configuration Note1			1	1	
Antenna Configuration			1x2	1x2	
Gap Pattern Id			0	-	
PBCH_RA		dB	0	0	
PBCH_RB		dB	0	0	
PSS_RA		dB	0	0	
SSS_RA		dB	0	0	
PCFICH_RB		dB	0	-∞	
PHICH_RA		dB	0	-∞	
PHICH_RB		dB	0	-∞	
PDCCH_RA		dB	0	-∞	
PDCCH_RB		dB	0	-∞	
PDSCH_RA		dB	0	-∞	
PDSCH_RB		dB	0	-∞	
OCNG_RA Note2		dB	0	-∞	
OCNG_RB Note2		dB	0	-∞	
AllowedMeasBandwidth in TS 36.331 [2]		RB	6	50	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	
PDSCH allocation		n_{PRB}	13-36	-	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD	-	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)			OP.1 TDD	-	
I_{ot} Note3	bandwidth	n_{PRB}	0-49	0-21 28-49	22-27
		dBm/15 kHz	-94 + TT	-87 + TT	-110 + TT
$\hat{E}_s / I_{ot}$	bandwidth	n_{PRB}	0—49	0-21 28-49	22-27
		dB	-4 + TT	-3 + TT	20 + TT
RSRP Note4		dBm/15 kHz	-98	-90	
RSRQ Note4		dB	-16.25	-	
$WB\text{-}RSRQ_0$ Note4 in subframe 0		dB	-	-13.68	
$WB\text{-}RSRQ_1$ Note4 in subframe ≠ 0		dB	-	-13.63	
Io Note4		dBm/ 9 MHz	-64.76	-	
Io Note4 in symbol 0, 4, 11 of subframe 0		dBm/ 9 MHz	-	-82.38	
Io Note4 in symbol 7 of subframe 0		dBm/ 9 MHz	-	-82.20	
Io Note4 in symbol 0, 4, 7, 11 of subframes ≠ 0		dBm/ 9 MHz	-	-82.38	
Propagation condition		-	AWGN	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].
Note 2: OCNG shall be used such that Cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells not specified in the test, assumed to be constant over time and modelled as noise.
Note 4: RSRQ, RSRP, WB-RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. The stated values represent the weighted average over the allowed measurement bandwidth, and the WB-RSRQ values assume averaging over symbols 0, 4, 7

	and 11 of the subframe.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.20.1.5--2: TDD WB-RSRQ accuracy for the reported values

	Test 1
	All Bands
Normal Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS
Extreme Conditions	
Lowest reported value (Cell 1)	FFS
Highest reported value Cell 1)	FFS
Lowest reported value (Cell 2)	FFS
Highest reported value (Cell 2)	FFS

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.21 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.21.1.1 Test purpose

Same test purpose as in clause 9.2.5.1.

9.2.21.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.21.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.1.3.

9.2.21.1.4 Test description

9.2.21.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.21.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.21.1.4.2 Test procedure

Same test procedure as in clause 9.2.5.1.4.2 with the following exceptions:

- Instead of Table 9.2.5.1.5-1 → use Table 9.2.21.1.5-1.
- Instead of Table 9.2.5.1.5-2 → use Table 9.2.21.1.5-2.

9.2.21.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.21.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.21.1.5 Test requirement

Table 9.2.21.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.21.1.5-2.

Table 9.2.21.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation for 10MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.5 FDD	-
PDSCH allocation		n_{PRB}	13-36	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.11 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD), D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.1 FDD	OP.15 FDD	OP.16 FDD
Io Note2	Bands FDD_A	dBm/9MHz	-90.26	N/A	
	Bands FDD_C		-89.26		
	Bands FDD_D		-88.76		
	Bands FDD_E, FDD_F		-88.26		
	Bands FDD_G		-87.26		
	Bands FDD_H		-86.76		
	Bands FDD_A	dBm/4.5MHz	N/A	-88.62	
	Bands FDD_C			-87.62	
	Bands FDD_D			-87.12	
	Bands FDD_E, FDD_F			-86.62	
	Bands FDD_G			-85.62	
	Bands FDD_H			-85.12	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.5.1.5-1 for the other parameters.					

Table 9.2.21.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.21.2.1 Test purpose

Same test purpose as in clause 9.2.5.2.1.

9.2.21.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.21.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.2.3.

9.2.21.2.4 Test description

9.2.21.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.21.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.21.2.4.2 Test procedure

Same test procedure as in clause 9.2.5.2.4.2 with the following exceptions:

- Instead of Table 9.2.5.2.5-1 → use Table 9.2.21.2.5-1.

- Instead of Table 9.2.5.2.5-2 → use Table 9.2.21.2.5-2.

9.2.21.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.21.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.21.2.5 Test requirement

Table 9.2.21.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.21.2.5-2.

Table 9.2.21.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation for 10MHz+5MHz

<table>
<tr><th colspan="2" rowspan="2">Parameters</th><th colspan="4">Test 1</th></tr>
<tr><th>Units</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">$BW_{channel\_CA}$ Note 1</td><td>MHz</td><td>10</td><td colspan="2">5</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>22-27</td><td colspan="2">10-15</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.1</td><td></td><td>R.0 FDD</td><td>R.5 FDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13-36</td><td>7-17</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1</td><td></td><td>R.6 FDD</td><td colspan="2">R.11 FDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.1.1 (OP.1 FDD), D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)</td><td></td><td>OP.1 FDD</td><td>OP.15 FDD</td><td>OP.16 FDD</td></tr>
<tr><td rowspan="12">Io Note2</td><td>Bands FDD_A</td><td rowspan="6">dBm/9MHz</td><td>-90.26</td><td colspan="2" rowspan="6">N/A</td></tr>
<tr><td>Bands FDD_C</td><td>-89.26</td></tr>
<tr><td>Bands FDD_D</td><td>-88.76</td></tr>
<tr><td>Bands FDD_E, FDD_F</td><td>-88.26</td></tr>
<tr><td>Bands FDD_G</td><td>-87.26</td></tr>
<tr><td>Bands FDD_H</td><td>-86.76</td></tr>
<tr><td>Bands FDD_A</td><td rowspan="6">dBm/4.5MHz</td><td rowspan="6">N/A</td><td colspan="2">-88.62</td></tr>
<tr><td>Bands FDD_C</td><td colspan="2">-87.62</td></tr>
<tr><td>Bands FDD_D</td><td colspan="2">-87.12</td></tr>
<tr><td>Bands FDD_E, FDD_F</td><td colspan="2">-86.62</td></tr>
<tr><td>Bands FDD_G</td><td colspan="2">-85.62</td></tr>
<tr><td>Bands FDD_H</td><td colspan="2">-85.12</td></tr>
<tr><td colspan="6">Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.5.2.5-1 for the other parameters</td></tr>
</table>

Table 9.2.21.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x +9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.22 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.22.1.1 Test purpose

Same test purpose as in clause 9.2.6.1.1.

9.2.22.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.22.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.13.

9.2.22.1.4 Test description

9.2.22.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for Cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.22.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.22.1.4.2 Test procedure

Same test procedure as in clause 9.2.6.1.4.2 with the following exceptions:

- Instead of Table 9.2.6.1.5-1 → use Table 9.2.22.1.5-1.
- Instead of Table 9.2.6.1.5-2 → use Table 9.2.22.1.5-2.

9.2.22.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.22.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.22.1.5 Test requirement

Table 9.2.22.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.22.1.5-2.

Table 9.2.22.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 10MHz+5MHz

<table>
<tr><th colspan="2" rowspan="2">Parameters</th><th colspan="4">Test 1</th></tr>
<tr><th>Units</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">$BW_{channel\_CA}$ Note1</td><td>MHz</td><td>10</td><td colspan="2">5</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>22-27</td><td colspan="2">10-15</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.1.2</td><td></td><td>R.0 TDD</td><td>R.4TDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13-36</td><td>7-17</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td>R.6 TDD</td><td colspan="2">R.11 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in
D.2.1 (OP.1 TDD),
D.2.9 (OP.9 TDD) and
D.2.10 (OP.10 TDD)</td><td></td><td>OP.1 TDD</td><td>OP.9 TDD</td><td>OP.10 TDD</td></tr>
<tr><td rowspan="6">Io Note2</td><td>Bands TDD_A</td><td rowspan="3">dBm/9MHz</td><td>-90.26</td><td colspan="2" rowspan="3">N/A</td></tr>
<tr><td>Bands TDD_C</td><td>-89.26</td></tr>
<tr><td>Bands TDD_E</td><td>-88.26</td></tr>
<tr><td>Bands TDD_A</td><td rowspan="3">dBm/4.5MHz</td><td rowspan="3">N/A</td><td colspan="2">-88.62</td></tr>
<tr><td>Bands TDD_C</td><td colspan="2">-87.62</td></tr>
<tr><td>Bands TDD_E</td><td colspan="2">-86.62</td></tr>
<tr><td colspan="6">Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves
Note 3: See Table 9.2.6.1.5-1 for the other parameters</td></tr>
</table>

Table 9.2.22.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.22.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz

9.2.22.2.1 Test purpose

Same test purpose as in clause 9.2.6.2.1.

9.2.22.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 11 and forward that support CA.

9.2.22.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.3.

9.2.22.2.4 Test description

9.2.22.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz for Cell 1 on the PCC, 5MHz for Cell 2 on the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.22.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.22.2.4.2 Test procedure

Same test procedure as in clause 9.2.6.2.4.2 with the following exceptions:

- Instead of Table 9.2.6.2.5-1 → use Table 9.2.22.2.5-1.
- Instead of Table 9.2.6.2.5-2 → use Table 9.2.22.2.5-2.

9.2.22.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.22.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement for 10MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.22.2.5 Test requirement

Table 9.2.22.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.22.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation for 10MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	10	5	
Measurement bandwidth		n_{PRB}	22-27	10-15	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.4TDD	-
PDSCH allocation		n_{PRB}	13-36	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.11 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD), D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.1 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A	dBm/9MHz	-90.26	N/A	
	Bands TDD_C		-89.26		
	Bands TDD_E		-88.26		
	Bands TDD_A	dBm/4.5MHz	N/A	-88.62	
	Bands TDD_C			-87.62	
	Bands TDD_E			-86.62	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.6.2.5-1 for the other parameters.					

Table 9.2.22.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 10MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.23 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.23.1.1 Test purpose

Same test purpose as in clause 9.2.5.1.

9.2.23.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.23.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.1.3.

9.2.23.1.4 Test description

9.2.23.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.23.1.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.23.1.4.2 Test procedure

Same test procedure as in clause 9.2.5.1.4.2 with the following exceptions:

- Instead of Table 9.2.5.1.5-1 → use Table 9.2.23.1.5-1.

- Instead of Table 9.2.5.1.5-2 → use Table 9.2.23.1.5-2.

9.2.23.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.23.1.4.3-1: Common Exception messages for FDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.23.1.5 Test requirement

Table 9.2.23.1.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.23.1.5-2.

Table 9.2.23.1.5-1: Cell Specific Test requirement Parameters for FDD RSRQ absolute accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Units	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5MHz	-93.26	-88.62	
	Bands FDD_C Note 5		-92.26	-87.62	
	Bands FDD_D		-91.76	-87.12	
	Bands FDD_E, FDD_F Note 5		-91.26	-86.62	
	Bands FDD_G Note 5		-90.26	-85.62	
	Bands FDD_H Note 5		-89.76	-85.12	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.5.1.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.2.23.1.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.23.2.1 Test purpose

Same test purpose as in clause 9.2.5.2.1.

9.2.23.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.23.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.5.2.3.

9.2.23.2.4 Test description

9.2.23.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for cells on both the PCC and the SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.23.2.4.3.

4. There are two E-UTRA FDD carriers with one cell on one E-UTRA FDD carrier and two cells on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.23.2.4.2 Test procedure

Same test procedure as in clause 9.2.5.2.4.2 with the following exceptions:

- Instead of Table 9.2.5.2.5-1 → use Table 9.2.23.2.5-1.
- Instead of Table 9.2.5.2.5-2 → use Table 9.2.23.2.5-2.

9.2.23.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.23.2.4.3-1: Common Exception messages for FDD RSRQ relative accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.23.2.5 Test requirement

Table 9.2.23.2.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.23.2.5-2.

Table 9.2.23.2.5-1: Cell Specific Test requirement Parameters for FDD RSRQ relative accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note 1		MHz	5	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.1.1			R.5 FDD	R.5 FDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.11 FDD	R.11 FDD	R.11 FDD
OCNG Patterns defined in D.1.15 (OP.15 FDD) and D.1.16 (OP.16 FDD)			OP.15 FDD	OP.15 FDD	OP.16FDD
Io Note2	Bands FDD_A Note 5	dBm/4.5MHz	-93.26	-88.62	
	Bands FDD_C Note 5		-92.26	-87.62	
	Bands FDD_D		-91.76	-87.12	
	Bands FDD_E, FDD_F Note 5		-91.26	-86.62	
	Bands FDD_G Note 5		-90.26	-85.62	
	Bands FDD_H Note 5		-89.76	-85.12	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: See Table 9.2.5.1.5-1 for the other parameters. Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.2.23.2.5-2: FDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.24 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.24.1.1 Test purpose

Same test purpose as in clause 9.2.6.1.1.

9.2.24.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.24.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.13.

9.2.24.1.4 Test description

9.2.24.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for Cells on both the PCC and SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.24.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.24.1.4.2 Test procedure

Same test procedure as in clause 9.2.6.1.4.2 with the following exceptions:

- Instead of Table 9.2.6.1.5-1 → use Table 9.2.24.1.5-1.

- Instead of Table 9.2.6.1.5-2 → use Table 9.2.24.1.5-2.

9.2.24.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.24.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.24.1.5 Test requirement

Table 9.2.24.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.24.1.5-2.

Table 9.2.24.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 5MHz+5MHz

Parameters		Test 1			
		Units	Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	10	5	5
Measurement bandwidth		n_{PRB}	10-15	10-15	10-15
PDSCH Reference measurement channel defined in A.2.1			R.4 TDD	R.4 TDD	N/A
PDSCH allocation		n_{PRB}	7-17	7-17	N/A
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.11 TDD	R.11 TDD	R.11 TDD
OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)			OP.9 TDD	OP.9 TDD	OP.10 TDD
Io Note2	Bands TDD_A Note 5	dBm4.5MHz	-93.26	-88.62	
	Bands TDD_C Note 5		-92.26	-87.62	
	Bands TDD_E Note 5		-91.26	-86.62	
Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves Note 3: See Table 9.2.6.1.5-1 for the other parameters Note 4: E-UTRA operating band groups are as defined in Section 3.5.1. Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.					

Table 9.2.24.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz

9.2.24.2.1 Test purpose

Same test purpose as in clause 9.2.6.2.1.

9.2.24.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.24.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.3.

9.2.24.2.4 Test description

9.2.24.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 5 MHz for Cells on both the PCC and SCC as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.24.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.24.2.4.2 Test procedure

Same test procedure as in clause 9.2.6.2.4.2 with the following exceptions:

- Instead of Table 9.2.6.2.5-1 → use Table 9.2.24.2.5-1.
- Instead of Table 9.2.6.2.5-2 → use Table 9.2.24.2.5-2.

9.2.24.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.24.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement for 5MHz+5MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.24.2.5 Test requirement

Table 9.2.24.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.24.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation for 5MHz+5MHz

<table>
<tr><th colspan="2" rowspan="2">Parameters</th><th colspan="4">Test 1</th></tr>
<tr><th>Units</th><th>Cell 1</th><th>Cell 2</th><th>Cell 3</th></tr>
<tr><td colspan="2">$BW_{channel\_CA}$ Note1</td><td>MHz</td><td>10</td><td>5</td><td>5</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td>10-15</td><td>10-15</td><td>10-15</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined in A.2.1</td><td></td><td>R.4 TDD</td><td>R.4 TDD</td><td>N/A</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>7-17</td><td>7-17</td><td>N/A</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td>R.11 TDD</td><td>R.11 TDD</td><td>R.11 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.2.9 (OP.9 TDD) and D.2.10 (OP.10 TDD)</td><td></td><td>OP.9 TDD</td><td>OP.9 TDD</td><td>OP.10 TDD</td></tr>
<tr><td rowspan="3">Io Note2</td><td>Bands TDD_A Note 5</td><td rowspan="3">dBm4.5MHz</td><td>-93.26</td><td colspan="2">-88.62</td></tr>
<tr><td>Bands TDD_C Note 5</td><td>-92.26</td><td colspan="2">-87.62</td></tr>
<tr><td>Bands TDD_E Note 5</td><td>-91.26</td><td colspan="2">-86.62</td></tr>
<tr><td colspan="6">Note 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: See Table 9.2.6.1.5-1 for the other parameters.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.1.
Note 5: The test applies for E-UTRA operating bands in this band group which are supporting 5MHz + 5MHz channel bandwidth.</td></tr>
</table>

Table 9.2.24.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 5MHz+5MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.25 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

9.2.25.1.1 Test purpose

To verify that FDD and TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the TDD absolute RSRQ accuracy requirements of the secondary component carrier.

9.2.25.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell.

9.2.25.1.3 Minimum conformance requirements

The RSRQ measurement of an FDD cell on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurement of a TDD cell on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.25.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.25.1.3-1: RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.25.1.3-2.

Table 9.2.25.1.3-2: RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.25.

9.2.25.1.4 Test description

9.2.25.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.25.1.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.25.1.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA FDD carrier and one cell on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC and Cell 2 is the SCell on the Secondary Component Carrier (SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.25.1.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2) is configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.25.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.25.1.5-2. This counts respectively as a Pass or Fail for the events "Cell 1" and "Cell 2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event "Cell 2" is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1" and "Cell 2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.25.1.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.25.1.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.25.1.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.25.1.5 Test requirement

Table 9.2.25.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.25.1.5-2.

Table 9.2.25.1.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in FDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]			-	6
Uplink-downlink configuration[Note1]			-	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-	-116
	Bands TDD_C		-	-115
	Bands TDD_E		-	-114
	Bands FDD_A		-119.2	-
	Bands FDD_B		-118.7	-
	Bands FDD_C		-118.2	-
	Bands FDD_D		-117.7	-
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-
	Bands FDD_G		-116.2	-
	Bands FDD_H		-115.7	-
$\hat{E}_s/N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s/I_{ot}$		dB	-5.2	-5.2
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-	-121.2
	Bands TDD_C		-	-120.2
	Bands TDD_E		-	-119.2
	Bands FDD_A		-124.4	-
	Bands FDD_B		-123.9	-
	Bands FDD_C		-123.4	-
	Bands FDD_D		-122.9	-

	Bands FDD_E, Bands FDD_F Note 6		-122.4	-
	Bands FDD_G		-121.4	-
	Bands FDD_H		-120.9	-
RSRQ[Note4]	Bands TDD_A	dB	-	-17.14
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-17.14	-
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io[Note4]	Bands TDD_A	$dBm/BW_{channel}$	-	-87.07 + 10log($N_{RB,c}$/50)
	Bands TDD_C		-	-86.07 + 10log($N_{RB,c}$/50)
	Bands TDD_E		-	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_A		-90.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_B		-89.77 + 10log($N_{RB,c}$/50)	-
	Bands FDD_C		-89.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_D		-88.77 + 10log($N_{RB,c}$/50)	-
	Bands FDD_E, Bands FDD_F Note 6		-88.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_G		-87.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_H		-86.77 + 10log($N_{RB,c}$/50)	-
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.25.1.5-2: RSRQ absolute accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in FDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_14
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD

9.2.25.2.1 Test purpose

To verify that TDD-FDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD-FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.25.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with FDD as PCell.

9.2.25.2.3 Minimum conformance requirements

The RSRQ measurement of a TDD cell on the secondary component carrier is compared with the RSRQ measurement of an FDD cell on the primary component carrier, and shall meet the applicable relative accuracy requirements which are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.25.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1\big|_{dBm} - RSRP2\big|_{dBm} \right| \leq [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.25.2.3-1: RSRQ Inter-frequency relative accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.25.2.3-2.

Table 9.2.25.2.3-2: RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.25.

9.2.25.2.4 Test description

9.2.25.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in FDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.25.2.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.25.2.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA FDD carrier and one cell on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC and Cell 2 is the SCell on the Secondary Component Carrier

(SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.25.2.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2)is configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured from the secondary component carrier (Cell 2) compared with the RSRQ measured from the primary component carrier (Cell 1).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.25.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.25.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.25.2.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.25.2.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.25.2.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.25.2.5 Test requirement

Table 9.2.25.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.25.2.5-2.

Table 9.2.25.2.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in FDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			-	6
Uplink-downlink configuration Note1			-	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-	-116
	Bands TDD_C		-	-115
	Bands TDD_E		-	-114
	Bands FDD_A		-119.2	-
	Bands FDD_B		-118.7	-
	Bands FDD_C		-118.2	-
	Bands FDD_D		-117.7	-
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-
	Bands FDD_G		-116.2	-
	Bands FDD_H		-115.7	-
$\hat{E}_s/N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s/I_{ot}$		dB	-5.2	-5.2
RSRP Note4	Bands TDD_A	dBm/15 kHz	-	-121.2
	Bands TDD_C		-	-120.2
	Bands TDD_E		-	-119.2
	Bands FDD_A		-124.4	-
	Bands FDD_B		-123.9	-
	Bands FDD_C		-123.4	-
	Bands FDD_D		-122.9	-

	Bands FDD_E, Bands FDD_F Note 6		-122.4	-
	Bands FDD_G		-121.4	-
	Bands FDD_H		-120.9	-
RSRQ Note4	Bands TDD_A	dB	-	-17.14
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-17.14	-
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	dBm/$BW_{channel}$	-	$-87.07 + 10\log(N_{RB,c}/50)$
	Bands TDD_C		-	$-86.07 + 10\log(N_{RB,c}/50)$
	Bands TDD_E		-	$-85.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_A		$-90.27 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_B		$-89.77 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_C		$-89.27 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_D		$-88.77 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_E, Bands FDD_F Note 6		$-88.27 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_G		$-87.27 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_H		$-86.77 + 10\log(N_{RB,c}/50)$	-
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.25.2.5-2: RSRQ relative accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in FDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 10
Highest reported value (Cell 2)	RSRQ_x + 10
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x + 10
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.26 RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

9.2.26.1.1 Test purpose

To verify that FDD and TDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD absolute RSRQ accuracy requirements of the primary component carrier and the FDD absolute RSRQ accuracy requirements of the secondary component carrier.

9.2.26.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell.

9.2.26.1.3 Minimum conformance requirements

The RSRQ measurement of a TDD cell on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurement of an FDD cell on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.26.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.26.1.3-1: RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.26.1.3-2.

Table 9.2.26.1.3-2: RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.5.1 and A.9.2.26.

9.2.26.1.4 Test description

9.2.26.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.26.1.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.26.1.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA TDD carrier and one cell on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCCand Cell 2 is the SCell on the Secondary Component Carrier

(SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.26.1.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2) is configured. The SCell (Cell 2) on the SCC is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier (Cell 2).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.26.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ values for Cell 1 and Cell 2 by the UE are compared to the actual RSRQ values according to Table 9.2.26.1.5-2. This counts respectively as a Pass or Fail for the events “Cell 1” and “Cell 2”. If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the respective event ”Cell 2” is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1” and “Cell 2” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If both events pass, the test passes. If one event fails, the test fails.

9.2.26.1.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.26.1.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.26.1.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.26.1.5 Test requirement

Table 9.2.26.1.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.26.1.5-2.

Table 9.2.26.1.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in TDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]			6	-
Uplink-downlink configuration[Note1]			1	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-119.2	-
	Bands TDD_C		-118.2	-
	Bands TDD_E		-117.2	-
	Bands FDD_A		-	-116
	Bands FDD_B		-	-115.5
	Bands FDD_C		-	-115
	Bands FDD_D		-	-114.5
	Bands FDD_E, Bands FDD_F Note 6		-	-114
	Bands FDD_G		-	-113
	Bands FDD_H		-	-112.5
$\hat{E}_s/N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s/I_{ot}$		dB	-5.2	-5.2
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4	-
	Bands TDD_C		-123.4	-
	Bands TDD_E		-122.4	-
	Bands FDD_A		-	-121.2
	Bands FDD_B		-	-120.7
	Bands FDD_C		-	-120.2
	Bands FDD_D		-	-119.7

	Bands FDD_E, Bands FDD_F Note 6		-	-119.2
	Bands FDD_G		-	-118.2
	Bands FDD_H		-	-117.7
RSRQ Note4	Bands TDD_A	dB	-17.14	-
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-	-17.14
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	$dBm/BW_{channel}$	$-90.27 + 10\log(N_{RB,c}/50)$	-
	Bands TDD_C		$-89.27 + 10\log(N_{RB,c}/50)$	-
	Bands TDD_E		$-88.27 + 10\log(N_{RB,c}/50)$	-
	Bands FDD_A		-	$-87.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_B			$-86.57 + 10\log(N_{RB,c}/50)$
	Bands FDD_C		-	$-86.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_D		-	$-85.57 + 10\log(N_{RB,c}/50)$
	Bands FDD_E, Bands FDD_F Note 6		-	$-85.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_G		-	$-84.07 + 10\log(N_{RB,c}/50)$
	Bands FDD_H		-	$-83.57 + 10\log(N_{RB,c}/50)$
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.26.1.5-2: RSRQ absolute accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in TDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_14
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.26.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD

9.2.26.2.1 Test purpose

To verify that TDD-FDD relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the TDD-FDD relative RSRQ accuracy requirements between the primary and secondary component carriers.

9.2.26.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward that support E-UTRA FDD and TDD and 2DL TDD-FDD CA with TDD as PCell.

9.2.26.2.3 Minimum conformance requirements

The RSRQ measurement of an FDD cell on the secondary component carrier is compared with the RSRQ measurement of a TDD cell on the primary component carrier, and shall meet the applicable relative accuracy requirements which are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.26.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.4 for a corresponding Band.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

|Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.26.2.3-1: RSRQ Inter-frequency relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.26.2.3-2.

Table 9.2.26.2.3-2: RSRQ relative accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.3, clause 9.1.6.2 and A.9.2.26.

9.2.26.2.4 Test description

9.2.26.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and [4.3.1] for different CA bandwidth classes.

Channel Bandwidth to be tested: Any one of the supported TDD-FDD CA configurations with PCell in TDD with the largest aggregated CA bandwidth combination supported by UE from Table 9.2.26.2.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.45 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.26.2.4.3.

4. There are two E-UTRA carriers with one cell on one E-UTRA TDD carrier and one cell on the other E-UTRA FDD carrier specified in the test. Cell 1 is PCell on the PCC and Cell 2 is the SCell on the Secondary Component

Carrier (SCC). PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 shall be powered OFF.

9.2.26.2.4.2 Test procedure

The test consists of Cell 1 the PCell, and Cell 2 the SCell on the Secondary Component Carrier (SCC). The SCell (Cell 2) is configured. The SCell (Cell 2) on the SCC is activated. The relative accuracy of RSRQ is defined as the RSRQ measured from the secondary component carrier (Cell 2) compared with the RSRQ measured from the primary component carrier (Cell 1).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.26.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

6. SS shall transmit an RRCConnectionReconfiguration message.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.26.2.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

10. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.

9.2.26.2.4.3 Message contents

Message contents are according to TS 36.508 [7] with the following exceptions:

Table 9.2.26.2.4.3-1: Common Exception messages for RSRQ for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5a

Table 9.2.26.2.4.3-2: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA without NeighCell

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

9.2.26.2.5 Test requirement

Table 9.2.26.2.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.26.2.5-2.

Table 9.2.26.2.5-1: Cell Specific Test requirement Parameters for TDD-FDD Carrier Aggregation with PCell in TDD test parameters

Parameter		Unit	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]			6	-
Uplink-downlink configuration[Note1]			1	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in A.3.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-119.2	-
	Bands TDD_C		-118.2	-
	Bands TDD_E		-117.2	-
	Bands FDD_A		-	-116
	Bands FDD_B		-	-115.5
	Bands FDD_C		-	-115
	Bands FDD_D		-	-114.5
	Bands FDD_E, Bands FDD_F Note 6		-	-114
	Bands FDD_G		-	-113
	Bands FDD_H		-	-112.5
$\hat{E}_s/N_{oc}$		dB	-5.2	-5.2
$\hat{E}_s/I_{ot}$		dB	-5.2	-5.2
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4	-
	Bands TDD_C		-123.4	-
	Bands TDD_E		-122.4	-
	Bands FDD_A		-	-121.2
	Bands FDD_B		-	-120.7
	Bands FDD_C		-	-120.2
	Bands FDD_D		-	-119.7

	Bands FDD_E, Bands FDD_F Note 6		-	-119.2
	Bands FDD_G		-	-118.2
	Bands FDD_H		-	-117.7
RSRQ Note4	Bands TDD_A	dB	-17.14	-
	Bands TDD_C			
	Bands TDD_E			
	Bands FDD_A		-	-17.14
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, Bands FDD_F Note 6			
	Bands FDD_G			
	Bands FDD_H			
Io Note4	Bands TDD_A	dBm/$BW_{channel}$	-90.27 + 10log($N_{RB,c}$/50)	-
	Bands TDD_C		-89.27 + 10log($N_{RB,c}$/50)	-
	Bands TDD_E		-88.27 + 10log($N_{RB,c}$/50)	-
	Bands FDD_A		-	-87.07 + 10log($N_{RB,c}$/50)
	Bands FDD_B			-86.57 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-	-86.07 + 10log($N_{RB,c}$/50)
	Bands FDD_D		-	-85.57 + 10log($N_{RB,c}$/50)
	Bands FDD_E, Bands FDD_F Note 6		-	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_G		-	-84.07 + 10log($N_{RB,c}$/50)
	Bands FDD_H		-	-83.57 + 10log($N_{RB,c}$/50)
Propagation Condition			AWGN	AWGN
Antenna Configuration			1x2	1x2
Timing offset to Cell 1		μs	-	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.26.2.5-2: RSRQ relative accuracy requirements for the reported values for TDD-FDD Carrier Aggregation with PCell in TDD

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x – 10
Highest reported value (Cell 2)	RSRQ_x + 10
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x + 10
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.27 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz

9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz

9.2.27.1.1 Test purpose

Same test purpose as in clause 9.2.6.1.1.

9.2.27.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.27.1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.13.

9.2.27.1.4 Test description

9.2.27.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.2.27.1.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.27.1.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.27.1.4.2 Test procedure

Same test procedure as in clause 9.2.6.1.4.2 with the following exceptions:

- Instead of Table 9.2.6.1.5-1 → use Table 9.2.27.1.5-1.
- Instead of Table 9.2.6.1.5-2 → use Table 9.2.27.1.5-2.

9.2.27.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.27.1.4.3-1: Common Exception messages for TDD RSRQ absolute accuracy for Carrier Aggregation test requirement for 20MHz+10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.27.1.5 Test requirement

Table 9.2.27.1.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.27.1.5-2.

Table 9.2.27.1.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute accuracy for Carrier Aggregation for 20MHz+10MHz

Parameters		Units	Combination	Test 1		
				Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1		MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
			10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth		n_{PRB}	20MHz+10MHz	47-52	22-27	
			10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.1.2			20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
			10MHz+20MHz	R.0 TDD	R.3 TDD	
PDSCH allocation		n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
			10MHz+20MHz	13-36	38-61	
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	R.6 TDD
			10MHz+20MHz	R.6 TDD	R.10 TDD	R.10 TDD
OCNG Patterns defined in D.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io Note2	Bands TDD_A	$dBm/BW_{channel}$	All	-90.26 + $10\log(N_{RB,c}/50)$	N/A	
	Bands TDD_C			-89.26 + $10\log(N_{RB,c}/50)$		

	Bands TDD_E			-88.26 + 10log($N_{RB,c}$/50)	
	Bands TDD_A	dBm/$BW_{channel}$	All	N/A	-85.61 + 10log($N_{RB,c}$/50)
	Bands TDD_C				-84.61 + 10log($N_{RB,c}$/50)
	Bands TDD_E				-83.61 + 10log($N_{RB,c}$/50)
NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1. NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. NOTE 3: See Table 9.2.6.1.5-1 for the other parameters.					

Table 9.2.27.1.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation for 20MHz+10MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_16
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz

9.2.27.2.1 Test purpose

Same test purpose as in clause 9.2.6.2.1.

9.2.27.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support CA with Intra-band contiguous CA, or Inter-band CA.

This test case applies to all types of E-UTRA UE release 11 and forward that support CA with Intra-band non-contiguous CA.

9.2.27.2.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.6.2.3.

9.2.27.2.4 Test description

9.2.27.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-3 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The bandwidth combination supported by UE from Table 9.2.27.2.5-1 and Annex E table E-3 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.27.2.4.3.

4. There are two E-UTRA TDD carriers with one cell on one E-UTRA TDD carrier and two cells on the other E-UTRA TDD carrier specified in the test. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.27.2.4.2 Test procedure

Same test procedure as in clause 9.2.6.2.4.2 with the following exceptions:

- Instead of Table 9.2.6.2.5-1 → use Table 9.2.27.2.5-1.
- Instead of Table 9.2.6.2.5-2 → use Table 9.2.27.2.5-2.

9.2.27.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.27.2.4.3-1: Common Exception messages for TDD RSRQ relative accuracy for Carrier Aggregation test requirement for 20MHz+10MHz

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.4.2-1 Table H.3.5-4 Table H.4.1-5

9.2.27.2.5 Test requirement

Table 9.2.27.2.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.5.2.5-2.

Table 9.2.27.2.5-1: Cell Specific Test requirement Parameters for TDD RSRQ relative accuracy for Carrier Aggregation for 20MHz+10MHz

Parameters	Units	Combination	Test 1		
			Cell 1	Cell 2	Cell 3
$BW_{channel\_CA}$ Note1	MHz	20MHz+10MHz	20MHz: $N_{RB,c}$ = 100	10MHz: $N_{RB,c}$ = 50	
		10MHz+20MHz	10MHz: $N_{RB,c}$ = 50	20MHz: $N_{RB,c}$ = 100	
Measurement bandwidth	n_{PRB}	20MHz+10MHz	47-52	22-27	
		10MHz+20MHz	22-27	47-52	
PDSCH Reference measurement channel defined in A.1.2		20MHz+10MHz	R.3 TDD	R.0 TDD	N/A
		10MHz+20MHz	R.0 TDD	R.3 TDD	
PDSCH allocation	n_{PRB}	20MHz+10MHz	38-61	13-36	N/A
		10MHz+20MHz	13-36	38-61	

PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			20MHz+10MHz	R.10 TDD	R.6 TDD	R.6 TDD
			10MHz+20MHz	R.6 TDD	R.10 TDD	R.10 TDD
OCNG Patterns defined in D.2 (TDD)			20MHz+10MHz	OP.7 TDD	OP.1 TDD	OP.2 TDD
			10MHz+20MHz	OP.1 TDD	OP.7 TDD	OP.8 TDD
Io^{Note2}	Bands TDD_A	dBm/$BW_{channel}$	All	-90.26 + $10\log(N_{RB,c}/50)$	N/A	
	Bands TDD_C			-89.26 + $10\log(N_{RB,c}/50)$		
	Bands TDD_E			-88.26 + $10\log(N_{RB,c}/50)$		
	Bands TDD_A	dBm/$BW_{channel}$	All	N/A	-85.61 + $10\log(N_{RB,c}/50)$	
	Bands TDD_C				-84.61 + $10\log(N_{RB,c}/50)$	
	Bands TDD_E				-83.61 + $10\log(N_{RB,c}/50)$	

NOTE 1: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
NOTE 2: Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 3: See Table 9.2.6.1.5-1 for the other parameters.

Table 9.2.27.2.5-2: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation for 20MHz+10MHz

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_x - 12
Highest reported value (Cell 2)	RSRQ_x + 9
RSRQ_x is the reported value of Cell 1	

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal

9.2.28.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits.

9.2.28.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.2.28.3 Minimum conformance requirements

Intra-frequency absolute RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.5.1.

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.2.28.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.28.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.2.28.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.28.3-2: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

Note: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.4, clause 9.1.7 and A.9.2.28.

9.2.28.4 Test description

9.2.28.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.28.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.28.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.28.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.28.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

9.2.28.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.28.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.28.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.28.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.28.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.2.28.5 Test requirement

Table 9.2.28.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.28.5-2.

Table 9.2.28.5-1: RSRQ FDD Intra frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Measurement bandwidth		n_{PRB}	22—27	
DMTC period		ms	N/A	160
DMTC period offset		ms	N/A	10
Discovery signal occasion duration		ms	N/A	1
Time offset between cell 1 and cell 2		µs	0	2.3
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	*13—36*	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-116	
	Bands FDD_B		-115.5	
	Bands FDD_C		-115	
	Bands FDD_D		-114.5	
	Bands FDD_E, FDD_F Note 5		-114	
	Bands FDD_G Note 7		-113	
	Bands FDD_H		-112.5	
$\hat{E}_s/I_{ot}$		dB	-5.17	-5.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-119.60	-119.60
	Bands FDD_B		-119.10	-119.10
	Bands FDD_C		-118.60	-118.60
	Bands FDD_D		-118.10	-118.10
	Bands FDD_E, FDD_F Note 5		-117.60	-117.60
	Bands FDD_G Note 7		-116.60	-116.60
	Bands FDD_H		-116.10	-116.10
RSRQ Note3	Bands FDD_A	dB	-17.12	-17.12
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/9 MHz	-85.49	
	Bands FDD_B		-84.99	
	Bands FDD_C		-84.49	
	Bands FDD_D		-83.99	
	Bands FDD_E, FDD_F Note 5		-83.49	
	Bands FDD_G Note 7		-82.49	
	Bands FDD_H		-81.99	
$\hat{E}_s/N_{oc}$		dB	-3.60	-3.60
Propagation condition		-	AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.
Note 7:	Except Band 29 and Band 32.

Table 9.2.28.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1 **All bands**
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal

9.2.29.1 Test purpose

Same test purpose as in clause 9.2.28.1.

9.2.29.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16.

9.2.29.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.28.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.4, clause 9.1.7 and A.9.2.29.

9.2.29.4 Test description

9.2.29.4.1 Initial conditions

Same initial conditions as in clause 9.2.28.4.1 with the following exceptions:

- Message contents are defined in clause 9.2.29.4.3.

9.2.29.4.2 Test procedure

Same test procedure as in clause 9.2.28.4.2 with the following exceptions:

- Instead of Table 9.2.28.5-1 → use Table 9.2.29.5-1.

- Instead of Table 9.2.28.5-2 → use Table 9.2.29.5-2.

9.2.29.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.29.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.29.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.29.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.29.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f1)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.2.29.5 Test requirement

Table 9.2.29.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.29.5-2.

Table 9.2.29.5-1: RSRQ TDD Intra frequency test parameters

Parameter		Unit	Test 1 Cell 1	Test 1 Cell 2
E-UTRA RF Channel Number			1	
$BW_{channel}$		MHz	10	
Special subframe configuration[Note1]			6	
Uplink-downlink configuration[Note1]			1	
Measurement bandwidth		n_{PRB}	22—27	
DMTC period		ms	N/A	160
DMTC period offset		ms	N/A	10
Discovery signal occasion duration		ms	N/A	2
Time offset between cell 1 and cell 2		µs	0	2.3
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note1]				
OCNG_RB[Note1]				
N_{oc} [Note2]	Bands TDD_A	dBm/15 kHz	-116	
	Bands TDD_C		-115	
	Bands TDD_E		-114	
$\hat{E}_s/I_{ot}$		dB	-5.17	-5.17
RSRP[Note3]	Bands TDD_A	dBm/15 kHz	-119.60	-119.60
	Bands TDD_C		-118.60	-118.60
	Bands TDD_E		-117.60	-117.60
RSRQ[Note3]	Bands TDD_A	dB	-17.12	-17.12
	Bands TDD_C			
	Bands TDD_E			
Io[Note3]	Bands TDD_A	dBm/9 MHz	-85.49	
	Bands TDD_C		-84.49	
	Bands TDD_E		-83.49	
$\hat{E}_s/N_{oc}$		dB	-3.60	-3.60
Propagation condition		-	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211[9].

Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver

	antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.29.5-2: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1 All bands
Normal Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 2)	RSRQ_0
Highest reported value (Cell 2)	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal

9.2.30.1 Test purpose

The purpose of this test is to verify that the RSRQ absolute and relative measurement accuracies in CRS based discovery signal are within the specified limits.

9.2.30.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.2.30.3 Minimum conformance requirements

Inter-frequency absolute RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.6.1. Inter-frequency relative RSRQ measurement accuracy requirements in discovery signal occasions are the same as specified in TS36.133 [4] Section 9.1.6.2.

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.2.30.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.3 for a corresponding Band

Table 9.2.30.3-1: RSRQ Inter frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in Table 9.2.30.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.30.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table I.4.2 and I.4.3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.30.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.6 and A.9.2.30.

9.2.30.4 Test description

9.2.30.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.30.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.30.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.30.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the reported RSRQ values in periodical MeasurementReport messages.
   The reported RSRQ value of Cell 2 reported by the UE is compared to actual RSRQ value according to Table 9.2.30.5-2. This counts as a Pass or Fail for the events "Cell 2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
   The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.30.5-3. This counts as a Pass or Fail for the events "Cell 1-2". If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved..

Each of the events "Cell 1" and "Cell 1-2" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.30.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.30.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.30.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.30.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.30.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.2.30.5 Test requirement

Table 9.2.30.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.2.30.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.2.30.5-3.

Table 9.2.30.5-1: RSRQ in discovery signal occasions FDD—FDD Inter frequency test parameters

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
Gap Offset		ms	9	-
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	1
Time offset between cell 2 and cell 1		µs	3	
Measurement bandwidth		n_{PRB}	22-27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-
PDSCH allocation		n_{PRB}	13-36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-117.5	-117.2
	Bands FDD_B		-117	-116.7
	Bands FDD_C		-116.5	-116.2
	Bands FDD_D		-116	-115.7
	Bands FDD_E, FDD_F Note 5		-115.5	-115.2
	Bands FDD_G Note 7		-114.5	-114.2
	Bands FDD_H		-114	-113.7
$\hat{E}_s/I_{ot}$		dB	-5.20	-5.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-122.70	-122.40
	Bands FDD_B		-122.20	-121.90
	Bands FDD_C		-121.70	-121.40
	Bands FDD_D		-121.20	-120.90
	Bands FDD_E, FDD_F Note 5		-120.70	-120.40
	Bands FDD_G Note 7		-119.70	-119.40
	Bands FDD_H		-119.20	-118.90
RSRQ Note3	Bands FDD_A	dB	-17.14	-17.14
	Bands FDD_B			
	Bands FDD_C			
	Bands FDD_D			
	Bands FDD_E, FDD_F Note 5			
	Bands FDD_G Note 7			
	Bands FDD_H			
Io Note3	Bands FDD_A	dBm/ 9 MHz	-88.57	-88.27
	Bands FDD_B		-88.07	-87.77
	Bands FDD_C		-87.57	-87.27
	Bands FDD_D		-87.07	-86.77
	Bands FDD_E, FDD_F Note 5		-86.57	-86.27

	Bands FDD_G Note 7		-85.57	-85.27
	Bands FDD_H		-85.07	-84.77
$\hat{E}_s / N_{oc}$		dB	-5.20	-5.20
Propagation condition		-	AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: Except Band 29 and Band 32.				

Table 9.2.30.5-2: RSRQ FDD Inter frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_15

Table 9.2.30.5-3: RSRQ FDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal

9.2.31.1 Test purpose

Same test purpose as in clause 9.2.30.1.

9.2.31.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports CRS based discovery signals measurement. Applicability requires support for FGI bit 16 and 25.

9.2.31.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.30.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.14.2, clause 9.1.7 and A.9.2.31.

9.2.31.4 Test description

9.2.31.4.1 Initial conditions

Same initial conditions as in clause 9.2.30.4.1 with the following exceptions:

- Message contents are defined in clause 9.2.31.4.3.

9.2.31.4.2 Test procedure

Same test procedure as in clause 9.2.30.4.2 with the following exceptions:

- Instead of Table 9.2.30.5-1 → use Table 9.2.31.5-1.
- Instead of Table 9.2.30.5-2 → use Table 9.2.31.5-2.
- Instead of Table 9.2.30.5-3 → use Table 9.2.31.5-3.

9.2.31.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.31.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.31.4.3-2: *MeasResults*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultPCell EQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.31.4.3-3: *MeasResultListEUTRA*

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

Table 9.2.31.4.3-4: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(f2)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.2.31.5 Test requirement

Table 9.2.31.5-1 defines the primary level settings including test tolerances for all tests.

The RSRP absolute accuracy shall meet the reported values test requirements in table 9.2.31.5-2.

The RSRP relative accuracy shall meet the reported values test requirements in table 9.2.31.5-3.

Table 9.2.31.5-1: RSRQ TDD—TDD Inter frequency test parameters for TDD configuration 1

Parameter		Unit	Test 1	
			Cell 1	Cell 2
E-UTRA RF Channel Number			1	2
$BW_{channel}$		MHz	10	10
Gap Pattern Id			0	-
Gap Offset			9	-
DMTC period		ms	-	160
DMTC period offset		ms	-	10
Discovery signal occasion duration		ms	-	2
Time offset between cells		µs	0	3
Special subframe configuration Note1			6	
Uplink-downlink configuration Note1			1	
Measurement bandwidth		n_{PRB}	22-27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note2				
OCNG_RB Note2				
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-117.50	-117.20
	Bands TDD_C		-116.50	-116.20
	Bands TDD_E		-115.50	-115.20
$\hat{E}_s/I_{ot}$		dB	-5.20	-5.20
RSRP Note4	Bands TDD_A	dBm/15 kHz	-122.70	-122.40
	Bands TDD_C		-121.70	-121.40
	Bands TDD_E		-120.70	-120.40
RSRQ Note4	Bands TDD_A, TDD_C, TDD_E	dB	-17.14	-17.14
Io Note4	Bands TDD_A	dBm/9 MHz	-88.57	-88.27
	Bands TDD_C		-87.57	-87.27
	Bands TDD_E		-86.57	-86.27
$\hat{E}_s/N_{oc}$		dB	-5.20	-5.20
Propagation condition		-	AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent

	interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.31.5-2: RSRQ TDD Inter frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 2	RSRQ_0
Highest reported value (Cell 2)		RSRQ_15

Table 9.2.31.5-3: RSRQ TDD Inter frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_Cell 1 - 10
Highest reported value (Cell 2)		RSRQ_Cell 1 + 10

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.2.32.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy for carrier aggregation in CRS based discovery signal is within the specified limits under AWGN propagation conditions.

9.2.32.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.2.32.3 Minimum conformance requirements

RSRQ measurement of cells on the primary component carrier or any of the secondary component carrier(s) in discovery signal occasions shall meet the intrafrequency absolute accuracy requirements in TS36.133 [4] section 9.1.5.1.

The accuracy requirements in Table 9.2.32.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101[2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.32.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements in TS36.133 [4] sections 9.1.6.2.

The accuracy requirements in Table 9.2.32.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.32.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table I.4.2 and I.4.3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.30.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS 36.306 [14].

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.4, clause 9.1.7 and A.9.2.32.

9.2.32.4 Test description

9.2.32.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.41 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.32.4.3.
4. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the Secondary Component Carrier (SCC), and Cell 3 is a neighbour cell on the SCC. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.32.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCell according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [11], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133 [4], clauses 8.3.3.2).

5. Set the parameters according to Table 9.2.32.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit RRCConnectionReconfigurationComplete message.

8. UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRP values in periodical MeasurementReport messages.

   The reported RSRQ value of Cell 3 reported by the UE is compared to actual RSRP value according to Table 9.2.32.5-2. This counts as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

   The reported RSRQ value for Cell 3 is compared to the reported RSRP value for Cell1 for each MeasurementReport message according to Table 9.2.32.5-3. This counts as a Pass or Fail for the events “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

10. SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

11. If test configuration is Inter-band carrier aggregation, repeat steps 1-10 for switched PCell/SCell scenario according to the UE declared capability for UL support (within CA operation) in the individual bands.

9.2.32.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.32.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.32.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationFDD-r12	1		
}			
}			
}			
}			

9.2.32.5 Test requirement

Table 9.2.32.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.32.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in table 9.2.32.5-3.

Table 9.2.32.5-1: FDD RSRQ Carrier Aggregation Test Parameters

Parameters		Test 1			
		Units	**Cell 1**	**Cell 2**	**Cell 3**
E-UTRA RF Channel Number			1	2	2
$BW_{channel\_CA}$		MHz	10	10	10
DMTC period			N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration			N/A	N/A	1
Timing offset to Cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1	-
Measurement bandwidth		n_{PRB}	22—27	22—27	22—27
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD	R.6FDD	R.6 FDD
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.2.2 (OP.2 FDD)			OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-116	-116
	Bands FDD_C		-118.5	-115	-115
	Bands FDD_D		-118	-114.5	-114.5
	Bands FDD_E, FDD_F Note 6		-117.5	-114	-114
	Bands FDD_G		-116.5	-113	-113
	Bands FDD_H		-116	-112.5	-112.5+
$\hat{E}_s/I_{ot}$		dB	-4.0	-5.54	-5.16
RSRP Note3	Bands FDD_A	dBm/15 kHz	-123.5	-120	-119.70
	Bands FDD_C		-122.5	-119	-118.70
	Bands FDD_D		-122	-118.5	-118.20
	Bands FDD_E, FDD_F Note 6		-121.5	-118	-117.70
	Bands FDD_G		-120.5	-117	-116.70
	Bands FDD_H		-120	-116.5	-116.20
RSRQ Note3	Bands FDD_A	dB	-16.25	-17.40	-17.10
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io Note3	Bands FDD_A	dBm/9	-90.26	-85.61	-85.61

	Bands FDD_C	MHz	-89.26	-84.61	-84.61
	Bands FDD_D		-88.76	-84.11	-84.11
	Bands FDD_E, FDD_F Note 6		-88.26	-83.61	-83.61
	Bands FDD_G		-87.26	-82.61	-82.61
	Bands FDD_H		-86.76	-82.17+TT	-82.17+TT
$\hat{E}_s/N_{oc}$		dB	-4.0	-4.0	-3.70
Propagation condition		-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.. Note 8: E-UTRA operating band groups are as defined in Section 3.5.					

Table 9.2.32.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Event	**Test 1 All bands**
Normal Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ _14
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ _0
Highest reported value (Cell 3)		RSRQ _15

Table 9.2.32.5-3: RSRQ FDD Intra frequency relative accuracy requirements for the reported values

	Event	**Test 1 All bands**
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ _Cell 1 - 13
Highest reported value (Cell 3)		RSRQ _Cell 1 + 8
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ _Cell 1 - 13
Highest reported value (Cell 3)		RSRQ _Cell 1 + 8

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal

9.2.33.1 Test purpose

The purpose of this test is to verify that the RSRQ measurement accuracy for carrier aggregation in CRS based discovery signal is within the specified limits under AWGN propagation conditions.

9.2.33.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward and supports [CA and CRS based discovery signals measurement].

9.2.33.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.32.3.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.15.1, clause 9.1.14.4, clause 9.1.7 and A.9.2.33.

9.2.33.4 Test description

9.2.33.4.1 Initial conditions

Same initial conditions as in clause 9.2.32.4.1 with the following exceptions:

- Message contents are defined in clause 9.2.33.4.3.

9.2.33.4.2 Test procedure

Same test procedure as in clause 9.2.32.4.2 with the following exceptions:

- Instead of Table 9.2.32.5-1 → use Table 9.2.33.5-1.
- Instead of Table 9.2.32.5-2 → use Table 9.2.33.5-2.
- Instead of Table 9.2.32.5-3 → use Table 9.2.33.5-3

9.2.33.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.33.4.3-1: Common Exception message

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.33.4.3-2: MeasObjectEUTRA-GENERIC

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2: MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			Freq is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)
measDS-Config-r12 CHOICE {	Not present		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms160-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
durationTDD-r12	2		
}			
}			
}			
}			

9.2.33.5 Test requirement

Table 9.2.33.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in table 9.2.33.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in table 9.2.33.5-3.

Table 9.2.33.5-1: TDD RSRQ Carrier Aggregation Test Parameters

Parameter		Unit	Test 1		
			Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	2
$BW_{channel}$		MHz	10		
DMTC period			N/A	N/A	160
DMTC period offset			N/A	N/A	10
Discovery signal occasion duration			N/A	N/A	1
Timing offset to cell 1		µs	-	0	3
Time alignment error between cell 2 and cell 1			-	≤ Time alignment error as specified in 3GPP TS 36.104 [29] clause 6.5.3.1	-
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	22—27		
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD	R.6 TDD	R.6 TDD
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.5	-116	
	Bands TDD_C		-118.5	-115	
	Bands TDD_E		-117.5	-114	
$\hat{E}_s/I_{ot}$		dB	-4.0	-5.54	-5.16
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-123.5	-120	-119.70
	Bands TDD_C		-122.5	-119	-118.70
	Bands TDD_E		-121.5	-118	-117.70
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-16.25	-17.40	-17.10
Io[Note4]	Bands TDD_A	dBm/9 MHz	-90.26	-85.61	
	Bands TDD_C		-89.26	-84.61	
	Bands TDD_E		-88.26	-83.61	
$\hat{E}_s/N_{oc}$		dB	-4.0	-4.0	-3.70
Propagation condition		-	AWGN		

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.33.5-2: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 3	RSRQ_0
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.33.5-3: RSRQ TDD Intra frequency relative accuracy requirements for the reported values

	Event	Test 1 All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ _Cell 1 - 13
Highest reported value (Cell 3)		RSRQ _Cell 1 + 8
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ _Cell 1 - 13
Highest reported value (Cell 3)		RSRQ _Cell 1 + 8

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.34 to 9.2.37

9.2.38 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation

9.2.38.1 Test purpose

To verify that TDD-FDD RSRQ absolute and relative measurement accuracy in carrier aggregation with PCell in FDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.38.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE Release 12 and forward that support 3DL TDD-FDD CA with FDD as PCell.

9.2.38.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.38.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.38.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.38.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
  - Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
  - $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
  - $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27 dB$
- | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.38.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	$dBm/BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.38.3-3.

Table 9.2.38.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.38.

9.2.38.4 Test description

9.2.38.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.38.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1 Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.38.4.3.

4. Cell 1 is PCell in FDD on the primary component carrier, Cell 2 is SCell on SCC1, and Cell 3 is SCell on SCC2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.38.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCells (Cell 2 and Cell 3) on the SCCs as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.38.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2, and Cell 3 are compared to the actual RSRQ values according to Table 9.2.38.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, and “Cell 3”. If the UE fails to report the measurement value for Cell 1, Cell 2, or Cell 3, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ values for Cell 2 and Cell 3 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.38.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 1-3”. If the UE fails to report the measurement value for Cell 2 or Cell 3, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 1-2” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.38.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.38.4.3-1: Common Exception messages for 3DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.38.5 Test requirement

Table 9.2.38.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.38.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.38.5-3.

Table 9.2.38.5-1: 3 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation test parameters (cell #1, cell #2 and cell #3)

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	3
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]			-	6	6
Uplink/downlink configuration[Note1]			-	1	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15kHz	-	-116	-116
	Bands TDD_C		-	-115	-115
	Bands TDD_E		-	-114	-114
	Bands FDD_A		-119.2	-	-
	Bands FDD_C		-118.2	-	-
	Bands FDD_D		-117.7	-	-
	Bands FDD_E, Bands FDD_F Note 6		-117.2	-	-
	Bands FDD_G		-116.2	-	-
	Bands FDD_H		-115.7	-	-
$\hat{E}_s/N_{oc}$		dB	-5.2	-5.2	-5.2
$\hat{E}_s/I_{ot}$		dB	-5.2	-5.2	-5.2
RSRP[Note4]	Bands TDD_A	dBm/15kHz	-	-121.2	-121.2
	Bands TDD_C		-	-120.2	-120.2
	Bands TDD_E		-	-119.2	-119.2
	Bands FDD_A		-124.4	-	-
	Bands FDD_C		-123.4	-	-
	Bands FDD_D		-122.9	-	-
	Bands FDD_E,		-122.4	-	-

	Bands FDD_F Note 6				
	Bands FDD_G		-121.4	-	-
	Bands FDD_H		-120.9	-	-
RSRQ Note4	Bands TDD_A	dB	-	-17.14	-17.14
	Bands TDD_C				
	Bands TDD_E				
	Bands FDD_A		-17.14	-	-
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, Bands FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-	-87.07 + 10log($N_{RB,c}$/50)	-87.07 + 10log($N_{RB,c}$/50)
	Bands TDD_C		-	-86.07 + 10log($N_{RB,c}$/50)	-86.07 + 10log($N_{RB,c}$/50)
	Bands TDD_E		-	-85.07 + 10log($N_{RB,c}$/50)	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_A		-90.27 + 10log($N_{RB,c}$/50)	-	-
	Bands FDD_C		-89.27 + 10log($N_{RB,c}$/50)	-	-
	Bands FDD_D		-88.77 + 10log($N_{RB,c}$/50)	-	-
	Bands FDD_E, Bands FDD_F Note 6		-88.27 + 10log($N_{RB,c}$/50)	-	-
	Bands FDD_G		-87.27 + 10log($N_{RB,c}$/50)	-	-
	Bands FDD_H		-86.77 + 10log($N_{RB,c}$/50)	-	-
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			≤ TAE	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.38.5-2: RSRQ absolute accuracy requirements for the reported values for 3 DL PCell in FDD for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_14
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.38.5-3: RSRQ relative accuracy requirements for the reported values for 3 DL PCell in FDD for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.39 3DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation

9.2.39.1 Test purpose

The purpose of this test is to verify that the TDD-FDD RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.39.2 Test applicability

This test case applies to all types of UE Release 12 and forward supporting E-UTRA FDD and TDD and 3DL CA with TDD as PCell.

9.2.39.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The TDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.39.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.39.3-1: TDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The TDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.39.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- |Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.39.3-2: TDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.39.3-3.

Table 9.2.39.3-3: TDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.5.1, clause 9.1.6.2 and A.9.2.6.

9.2.39.4 Test description

9.2.39.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.39.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.39.4.3.

4. There are three E-UTRA TDD carriers. Cell 1 is PCell on the PCC, Cell 2 is the SCell on the SCC1, and Cell 3 is the SCell on the SCC2. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.39.4.2 Test procedure

The absolute accuracy of RSRQ is defined as the RSRQ measured from the PCC (Cell 1) and the RSRQ measured from the SCC1 (Cell 2) and SCC2 (Cell 3). The relative accuracy of RSRQ is defined as the RSRQ measured on PCC compared with RSRQ measured on SCC1 and SCC2,

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels except PHICH.
3. The SS shall configure the SCells (Cell 2 and Cell 3) on the SCC1 and SCC2 as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC1 and SCC2 by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.39.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2 and Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.39.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 3”. If the UE fails to report the measurement value for Cell 1, Cell 2, or Cell 3, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ values for Cell 2 and Cell 3 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.39.5-3. If the UE fails to report the measurement value for Cell 2 or Cell 3, the number of failed iterations for the respective event is increased by one.
10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 1-2” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass, the test passes. If one event fails, the test fails.

9.2.39.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.39.4.3-1: Common Exception messages for 3DL TDD RSRQ Accuracy for E-UTRA Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.39.5 Test requirement

Table 9.2.39.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.39.5-2 and Table 9.2.39.5-3.

Table 9.2.39.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute and relative accuracy for Carrier Aggregation

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	3
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			6	-	-
Uplink/downlink configuration Note1			1	-	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.1 and A.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1 and A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD
OCNG Patterns defined in D.1 and D.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA Note2					
OCNG_RB Note2					
N_{oc} Note3	Bands TDD_A	dBm/15kHz	-119.2	-	-
	Bands TDD_C		-118.2	-	-
	Bands TDD_E		-117.2	-	-
	Bands FDD_A		-	-116	-116
	Bands FDD_C		-	-115	-115
	Bands FDD_D		-	-114.5	-114.5
	Bands FDD_E, Bands FDD_F Note 6		-	-114	-114
	Bands FDD_G		-	-113	-113
	Bands FDD_H		-	-112.5	-112.5
$\hat{E}_s/N_{oc}$		dB	-5.20	-5.20	-5.20
$\hat{E}_s/I_{ot}$		dB	-5.20	-5.20	-5.20
RSRP Note4	Bands TDD_A	dBm/15kHz	-124.4	-	-
	Bands TDD_C		-123.4	-	-
	Bands TDD_E		-122.4	-	-
	Bands FDD_A		-	-121.2	-121.2
	Bands FDD_C		-	-120.2	-120.2
	Bands FDD_D		-	-119.7	-119.7
	Bands FDD_E, Bands FDD_F Note 6		-	-119.2	-119.2

	Bands FDD_G		-	-118.2	-118.2
	Bands FDD_H		-	-117.7	-117.7
RSRQ Note4	Bands TDD_A	dB	-17.14	-	-
	Bands TDD_C				
	Bands TDD_E				
	Bands FDD_A		-	-17.14	-17.14
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, Bands FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-90.27 + 10log($N_{RB,c}$/50)	-	-
	Bands TDD_C		-89.27 + 10log($N_{RB,c}$/50)	-	-
	Bands TDD_E		-88.27 + 10log($N_{RB,c}$/50)	-	-
	Bands FDD_A		-	-87.07 + 10log($N_{RB,c}$/50)	-87.07 + 10log($N_{RB,c}$/50)
	Bands FDD_C		-	-86.07 + 10log($N_{RB,c}$/50)	-86.07 + 10log($N_{RB,c}$/50)
	Bands FDD_D		-	-85.57 + 10log($N_{RB,c}$/50)	-85.57 + 10log($N_{RB,c}$/50)
	Bands FDD_E, Bands FDD_F Note 6		-	-85.07 + 10log($N_{RB,c}$/50)	-85.07 + 10log($N_{RB,c}$/50)
	Bands FDD_G		-	-84.07 + 10log($N_{RB,c}$/50)	-84.07 + 10log($N_{RB,c}$/50)
	Bands FDD_H		-	-83.57 + 10log($N_{RB,c}$/50)	-83.57 + 10log($N_{RB,c}$/50)
Propagation Condition			AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.39.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_14
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_14
Lowest reported value (Cell 3)	RSRQ_00
Highest reported value Cell 3)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value Cell 2)	RSRQ_15
Lowest reported value (Cell 3)	RSRQ_00
Highest reported value Cell 3)	RSRQ_15

Table 9.2.39.5-3: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.40 3DL FDD RSRQ for E-UTRAN in Carrier Aggregation

9.2.40.1 Test purpose

To verify that FDD absolute RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the FDD absolute RSRQ accuracy requirements of the primary component carrier and the secondary component carriers, the test will also verify the primary and secondary component carriers' relative RSRQ accuracy requirement.

9.2.40.2 Test applicability

This test case applies to all types of E-UTRA FDD UE release 10 and forward that support 3DL with Intra-band contiguous CA, or 3DL with Inter-band CA, or 3DL with Intra-band contiguous and Inter-band CA.

This test case also applies to all types of E-UTRA FDD UE release 11 and forward that support 3DL with Intra-band non-contiguous and Inter-band CA, or 3DL with Intra-band non-contiguous and Intra-band contiguous CA.

9.2.40.3 Minimum conformance requirements

The FDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The FDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.40.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

- Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.40.3-1: FDD RSRQ absolute accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The FDD RSRQ relative measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.40.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.
- $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band.
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- |Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.40.3-2: FDD RSRQ relative accuracy for Carrier Aggregation

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/$BW_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.40.3-3.

Table 9.2.40.3-3: FDD RSRQ absolute accuracy measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.11.1, 9.1.11.2, 9.1.11.3, 9.1.7, and A.9.2.40.

9.2.40.4 Test description

9.2.40.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.40.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.40.4.3.
4. There are three E-UTRA FDD carriers with one cell on each E-UTRA FDD carrier. Cell 1 is PCell on the PCC, Cell 2 and Cell 3 are the SCells on the Secondary Component Carriers SCC1 and SCC2 respectively. PCell (Cell 1) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.40.4.2 Test procedure

The test consists of Cell 1 the PCell, Cell 2 and Cell 3 the SCells on the Secondary Component Carrier SCC1 and SCC2. The SCell1 (Cell 2) and Scell2 (Cell 3) are configured and activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carriers (Cell 2 and Cell 3).

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCC according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure the SCell (Cell 2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.40.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2 and Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.40.5-2. These count respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 3”. If the UE fails to report the measurement value for Cell 1, Cell 2 or Cell 3, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ values for Cell 2 and Cell3 are compared to the reported RSRQ value for other cells for each MeasurementReport message according to Table 9.2.40.5-2. These count respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 1-3”. If the UE fails to report the measurement value for Cell 2 or Cell 3, the number of failed iterations is increased by one.
10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 1-2” and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.
If all events pass, the test passes. If one event fails, the test fails.

9.2.40.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.40.4.3-1: Common Exception messages for FDD RSRQ Accuracy E-UTRA for Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.40.5 Test requirement

Table 9.2.40.5-1 defines the primary level settings including test tolerances for all tests.

The FDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.40.5-2.

The FDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.40.5-3.

Table 9.2.40.5-1: 3 DL FDD RSRQ carrier aggregation test parameters

Parameter		Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number			1	2	3
$BW_{channel}$		MHz	5MHz:$N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz:$N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Measurement bandwidth		n_{PRB}	5MHz:10-15 10MHz:22-27 20MHz:47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.1			5MHz:R.5 FDD 10MHz:R.0 FDD 20MHz:R.4 FDD	5MHz:R.5 FDD 10MHz:R.0 FDD 20MHz:R.4 FDD	5MHz:R.5 FDD 10MHz:R.0 FDD 20MHz:R.4 FDD
PDSCH allocation		n_{PRB}	5MHz:7-17 10MHz:13-36 20MHz:38-61	5MHz:7-17 10MHz:13-36 20MHz:38-61	5MHz:7-17 10MHz:13-36 20MHz:38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			5MHz:R.11 FDD 10MHz:R.6 FDD 20MHz:R.10 FDD	5MHz:R.11 FDD 10MHz:R.6 FDD 20MHz:R.10 FDD	5MHz:R.11 FDD 10MHz:R.6 FDD 20MHz:R.10 FDD
OCNG Patterns defined in D.1			5MHz:OP.15 FDD 10MHz:OP.1 FDD 20MHz:OP.11 FDD	5MHz:OP.15 FDD 10MHz:OP.1 FDD 20MHz:OP.11 FDD	5MHz:OP.15 FDD 10MHz:OP.1 FDD 20MHz:OP.11 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.2	-116	-116
	Bands FDD_C		-118.2	-115	-115
	Bands FDD_D		-117.7	-114.5	-114.5
	Bands FDD_E, FDD_F Note 6		-117.2	-114	-114
	Bands FDD_G		-116.2	-113	-113
	Bands FDD_H		-115.7	-112.5	-112.5
$\hat{E}_s/N_{oc}$		dB	-5.20	-5.20	-5.20
$\hat{E}_s/I_{ot}$ Note3		dB	-5.20	-5.20	-5.20
RSRP Note3	Bands FDD_A	dBm/15 kHz	-124.4	-121.2	-121.2
	Bands FDD_C		-123.4	-120.2	-120.2
	Bands FDD_D		-122.9	-119.7	-119.7
	Bands FDD_E, FDD_F Note 6		-122.4	-119.2	-119.2
	Bands FDD_G		-121.4	-118.2	-118.2
	Bands FDD_H		-120.9	-117.7	-117.7
RSRQ Note3	Bands FDD_A Bands FDD_C Bands FDD_D Bands FDD_E, FDD_F Note 6 Bands FDD_G Bands FDD_H	dB	-17.14	-17.14	-17.14
Io Note3	Bands FDD_A	dBm/ $BW_{channel}$	-90.27+ 10log($N_{RB,c}$ /50)	-87.07+ 10log($N_{RB,c}$ /50)	-87.07+ 10log($N_{RB,c}$ /50)
	Bands FDD_C		-89.27+ 10log($N_{RB,c}$ /50)	-86.07+ 10log($N_{RB,c}$ /50)	-86.07+ 10log($N_{RB,c}$ /50)

	Bands FDD_D		-88.77+ 10log($N_{RB,c}$ /50)	-85.57+ 10log($N_{RB,c}$ /50)	-85.57+ 10log($N_{RB,c}$ /50)
	Bands FDD_E, FDD_F Note 6		-88.27+ 10log($N_{RB,c}$ /50)	-85.07+ 10log($N_{RB,c}$ /50)	-85.07+ 10log($N_{RB,c}$ /50)
	Bands FDD_G		-87.27+ 10log($N_{RB,c}$ /50)	-84.07+ 10log($N_{RB,c}$ /50)	-84.07+ 10log($N_{RB,c}$ /50)
	Bands FDD_H		-86.77+ 10log($N_{RB,c}$ /50)	-83.57+ 10log($N_{RB,c}$ /50)	-83.57+ 10log($N_{RB,c}$ /50)
Propagation condition		-	AWGN	AWGN	AWGN
Antenna Configuration		-	1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	0
Time alignment error relative to cell 1 Note 7			-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 7			-	-	≤ TAE
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: Es/Iot, RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs. Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation. Note 8: E-UTRA operating band groups are as defined in Section 3.5.					

Table 9.2.40.5-2: FDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_14
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_14
Lowest reported value (Cell 3)	RSRQ_00
Highest reported value (Cell 3)	RSRQ_14
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value Cell 1)	RSRQ_15
Lowest reported value (Cell 2)	RSRQ_00
Highest reported value (Cell 2)	RSRQ_15
Lowest reported value (Cell 3)	RSRQ_00
Highest reported value (Cell 3)	RSRQ_15

Table 9.2.40.5-3: 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation relative accuracy requirements for the reported values

	Event	
Normal and Extreme Conditions, all bands		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.41 3DL TDD RSRQ for E-UTRAN in Carrier Aggregation

9.2.41.1 Test purpose

To verify that TDD absolute and relative RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute RSRQ accuracy requirements of the primary component carrier, the absolute RSRQ accuracy requirements of the secondary component carriers, and also the relative RSRQ accuracy requirement between the primary and secondary component carriers.

9.2.41.2 Test applicability

This test applies to all types of E-UTRA UE TDD release 10 and forward that support 3DL with intra-band contiguous CA or 3DL with inter-band CA, or 3DL with intra-band contiguous and inter-band CA.

This test case also applies to all types of E-UTRA TDD UE release 11 and forward that support 3DL with intra-band non-contiguous and inter-band CA, or 3DLwith intra-band non-contiguous and intra-band contiguous CA.

9.2.41.3 Minimum conformance requirements

The TDD RSRQ measurements of cells on the primary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The TDD RSRQ measurements of cells on the secondary component carrier shall meet the intra frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.41.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.2.41.3-1: 3DL TDD RSRQ absolute for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

The TDD RSRQ measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier defined in TS 36.133 [4] clause 9.1.6.2. The applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements as defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.41.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.
- RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band.
- $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
- |Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.41.3-2: 3DL TDD RSRQ relative for Carrier Aggregation

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot Note 2	Io Note 1 range		
			E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.41.3-3.

Table 9.2.41.3-3: 3DL TDD RSRQ measurement report mapping for Carrier Aggregation

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.11.1, clause 9.1.11.2, clause 9.1.11.3, clause 9.1.5.1 and A.9.2.41.

9.2.41.4 Test description

9.2.41.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.41.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1[10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.63 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.41.4.3.
4. There are three E-UTRA TDD carriers and three cells specified in the test. Cell 1 is PCell on the primary component carrier (PCC), Cell 2 is the SCell on the Secondary Component Carrier (SCC1), and Cell 3 is the SCell on the Secondary Component Carrier (SCC2). Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.41.4.2 Test procedure

The test consists of Cell 1 the primary component carrier, Cell 2 and Cell 3 are the SCells on the secondary component carrier SCC1 and SCC2, respectively. The SCell1 (Cell 2) and SCell2 (Cell 3) on the SCC1 and SCC2 are configured. The SCell1 (Cell 2) on the SCC1 is activated and SCell2 (Cell 3) on the SCC2 is activated. The absolute accuracy of RSRQ is defined as the RSRQ measured from the primary component carrier (Cell 1) and the RSRQ measured from the secondary component carrier SCC1 (Cell 2) and secondary component carrier SCC2 (Cell 3). The relative accuracy of RSRQ is defined as the RSRQ measured cells on the primary component carrier (Cell 1) compared with measurements of cells on the secondary component carrier SCC1 (Cell 2) and secondary component carrier SCC2 (Cell 3),

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCCs according to Annex C.0, C.1 and C.2 for all downlink physical channels.
3. The SS shall configure the SCell1 (Cell 2) on the SCC1 and SCell2 (Cell 3) on the SCC2 as per TS 36.508 [7] clause 5.2A.4.
4. SS activates SCC1 and SCC2 by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.41.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
6. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit RRCConnectionReconfigurationComplete message.
8. UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6; SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2 and Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.41.5-2. These counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2” and “Cell 3”. If the UE fails to report the measurement value for Cell 2 or Cell 3, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ value for Cell 2 and Cell 3 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.41.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2” and “Cell 1-3”. If the UE fails to report the measurement value for Cell 2 or Cell 3, the number of failed iterations for the respective affected event is increased by one.
10. The SS shall check MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 1-2”, and “Cell 1-3” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.41.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.41.4.3-1: Common Exception messages for 3DL TDD RSRQ absolute for Carrier Aggregation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.41.5 Test requirement

Table 9.2.41.5-1 defines the primary level settings including test tolerances for all tests.

The TDD RSRQ absolute accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.41.5-2.

The TDD RSRQ relative accuracy for carrier aggregation test shall meet the reported values test requirements in Table 9.2.41.5-3.

Table 9.2.41.5-1: Cell Specific Test requirement Parameters for 3DL TDD RSRQ absolute for Carrier Aggregation

Parameter		Unit	Cell 1	Cell2	Cell3
E-UTRA RF Channel Number			1	2	3
$BW_{channel}$		MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration[Note1]			6		
Uplink-downlink configuration[Note1]			1		
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.1.2			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz:R.11 TDD 10MHz:R.6 TDD 20MHz:R.10 TDD	5MHz:R.11 TDD 10MHz:R.6 TDD 20MHz:R.10 TDD
OCNG Patterns defined in D.2.1, D.2.7, D.2.9			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA		dB	0	0	0
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB					
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA[Note2]					
OCNG_RB[Note2]					
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.2	-116	-116
	Bands TDD_C		-118.2	-115	-115
	Bands TDD_E		-117.2	-114	-114
$\hat{E}_s/N_{oc}$		dB	-5.20	-5.20	-5.20
$\hat{E}_s/I_{ot}$ Note4		dB	-5.20	-5.20	-5.20
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4	-121.2	-121.2
	Bands TDD_C		-123.4	-120.2	-120.2
	Bands TDD_E		-122.4	-119.2	-119.2
RSRQ[Note4]	Bands TDD_A, TDD_C, TDD_E	dB	-17.14	-17.14	-17.14
Io[Note4]	Bands TDD_A	dBm/ $BW_{channel}$	-90.27+ 10log($N_{RB,c}$ /50)	-87.07+ 10log($N_{RB,c}$ /50)	-87.07+ 10log($N_{RB,c}$ /50)
	Bands TDD_C		-89.27+ 10log($N_{RB,c}$ /50)	-86.07+ 10log($N_{RB,c}$ /50)	-86.07+ 10log($N_{RB,c}$ /50)
	Bands TDD_E		-88.27+ 10log($N_{RB,c}$ /50)	-85.07+ 10log($N_{RB,c}$ /50)	-85.07+ 10log($N_{RB,c}$ /50)
Propagation condition		-	AWGN	AWGN	AWGN

Antenna Configuration	-	1x2	1x2	1x2
Timing offset to Cell 1	µs	-	0	0
Time alignment error relative to cell 1 Note 7		-	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 7		-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211 [9].
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: Es/Iot, RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: Time alignment error (TAE) as specified in TS 36.104 [29] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.41.5-2: TDD RSRQ absolute requirements for the reported values for Carrier Aggregation

	Event	**All bands**
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value (Cell 1)		RSRQ_14
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_14
Lowest reported value (Cell3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_14
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_00
Highest reported value (Cell 1)		RSRQ_15
Lowest reported value (Cell 2)	Cell 2	RSRQ_00
Highest reported value (Cell 2)		RSRQ_15
Lowest reported value (Cell 3)	Cell 3	RSRQ_00
Highest reported value (Cell 3)		RSRQ_15

Table 9.2.41.5-3: 3DL TDD RSRQ relative requirements for the reported values for Carrier Aggregation

	Event	**All bands**
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x – 10
Highest reported value (Cell 2)		RSRQ_x + 10
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10
Highest reported value (Cell 3)		RSRQ_x + 10
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.42 FD-FDD RSRQ Intra frequency case for UE category 0

9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0

9.2.42.1.1 Test purpose

To verify the FD-FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.42.1.2 Test applicability

This test applies to all types of E-UTRA FD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.2.42.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.2.42.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.2.42.1.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±3.5	±5	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.3 and A.9.2.42.1.

9.2.42.1.4 Test description

9.2.42.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.42.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.42.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.42.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRQ reported value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.42.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.2.42.1.5-1 as appropriate.

9.2.42.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.42.1.4.3-1: Common Exception messages for RSRQ FD-FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.42.1.4.3-2: *MeasResults*: Additional RSRQ FD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.42.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.2.42.1.5 Test requirement

Table 9.2.42.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.2.42.1.5-2.

Table 9.2.42.1.5-1: FD-FDD RSRQ Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.3			R.13 FDD	-	R.13 FDD	-	R.13 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 5						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
$\hat{E}_s/I_{ot}$		dB	- 1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-82.81	-82.81	-106.75	-106.75	-119.60	-119.60
	Bands FDD_B						-119.10	-119.10
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F Note 4						-117.60	-117.60
	Bands FDD_G Note 6						-116.60	-116.60T
	Bands FDD_H						-116.10	-116.10
RSRQ Note3	Bands FDD_A	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
	Bands FDD_B							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 45							
	Bands FDD_G Note 6							
	Bands FDD_H							
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05		-73		-85.49	
	Bands FDD_B						-84.99	
	Bands FDD_C						-84.49	
	Bands FDD_D						-83.99	
	Bands FDD_E,						-83.49	

	FDD_F Note 4				
	Bands FDD_G Note 6				-82.49
	Bands FDD_H				-81.99
Propagation condition		-	AWGN	AWGN	AWGN
Correlation Matrix and Antenna Configuration			1x1	1x1	1x1

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.2.42.1.5-2: RSRQ FD-FDD Intra frequency absolute accuracy requirements for the reported values for UE category 0

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

9.2.43 HD-FDD RSRQ Intra frequency case for UE category 0

9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0

9.2.43.1.1 Test purpose

To verify the HD-FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.43.1.2 Test applicability

This test applies to all types of E-UTRA HD-FDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.2.43.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.2.43.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.2.43.1.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±3.5	±5	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.3 and A.9.2.43.1.

9.2.43.1.4 Test description

9.2.43.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.43.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.43.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.2.43.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRQ reported value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.43.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.43.1.5-1 as appropriate.

9.2.43.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.43.1.4.3-1: Common Exception messages for RSRQ HD-FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.43.1.4.3-2: *MeasResults*: Additional RSRQ HD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.43.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ HD-FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.2.43.1.5 Test requirement

Table 9.2.43.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.2.43.1.5-2.

Table 9.2.43.1.5-1: HD-FDD RSRQ Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.4			R.1 HD-FDD	-	R.1 HD-FDD	-	R.1 HD-FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.3			R.3 HD-FDD		R.3 HD-FDD		R.3 HD-FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and A.3.2.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands FDD_B						-115.5	
	Bands FDD_C						-115	
	Bands FDD_D						-114.5	
	Bands FDD_E, FDD_F Note 4						-114	
	Bands FDD_G Note 7						-113	
	Bands FDD_H						-112.5	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP Note3	Bands FDD_A	dBm/15 kHz	-82.81	-82.81	-106.75	-106.75	-119.60	-119.60
	Bands FDD_B						-119.10	-119.10
	Bands FDD_C						-118.60	-118.60
	Bands FDD_D						-118.10	-118.10
	Bands FDD_E, FDD_F Note 4						-117.60	-117.60
	Bands FDD_G Note 6						-116.60	-116.60
	Bands FDD_H						-116.10	-116.10
RSRQ Note3	Bands FDD_A	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
	Bands FDD_B							
	Bands FDD_C							
	Bands FDD_D							
	Bands FDD_E, FDD_F Note 4							
	Bands FDD_G Note 6							
	Bands FDD_H							
Io Note3	Bands FDD_A	dBm/9 MHz	-51.05		-73		-85.49	
	Bands FDD_B						-84.99	
	Bands FDD_C						-84.49	
	Bands FDD_D						-83.99	
	Bands FDD_E,						-83.49	

	FDD_F Note 4				
	Bands FDD_G Note 6				-82.49
	Bands FDD_H				-81.99
Propagation condition		-	AWGN	AWGN	AWGN
Correlation Matrix and Antenna Configuration			1x1	1x1	1x1

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: Es/Iot, RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 5: E-UTRA operating band groups are as defined in Section 3.5.
Note 6: Except Band 29 and Band 32.

Table 9.2.43.1.5-2: RSRQ FD-FDD Intra frequency absolute accuracy requirements for the reported values for UE category 0

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

9.2.44 TDD RSRQ Intra frequency case for UE category 0

9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

9.2.44.1.1 Test purpose

To verify the TDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.44.1.2 Test applicability

This test applies to all types of E-UTRA TDD Category 0 UE from release 12 and forward. Applicability requires support for FGI bit 16.

9.2.44.1.3 Minimum conformance requirements

The requirements for absolute accuracy of RSRQ in this clause apply to a cell on the same frequency as that of the serving cell for category 0 UE.

The accuracy requirements in Table 9.2.44.1.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex B.3.1 for a corresponding Band.
- At least 1 DL subframe per radio frame of measured cell is available at the UE for RSRQ measurement assuming measured cell is identified cell.

Table 9.2.44.1.3-1: RSRQ Intra frequency absolute accuracy for UE category 0

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
±3.5	±5	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_B	-120.5	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4.5	±5	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.13.3 and A.9.2.44.1.

9.2.44.1.4 Test description

9.2.44.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 using only main UE Tx/Rx antenna.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.44.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.2.44.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Set the parameters according to Table 9.2.44.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. After 10s wait from Step 3, SS shall check RSRQ reported value in periodical MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.44.1.5-2. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.44.1.5-1 as appropriate.

9.2.44.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.44.1.4.3-1: Common Exception messages for RSRQ TDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.44.1.4.3-2: *MeasResults*: Additional RSRQ TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement identity for which the reporting being performed	
measResultPCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.44.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId from Cell2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.2.44.1.5 Test requirement

Table 9.2.44.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.2.44.1.5-2.Table 9.2.44.1.5-1: TDD RSRQ Intra frequency test parameters for UE category 0

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration^Note1			6		6		6	
Uplink-downlink configuration^Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.5			R.12 TDD	-	R.12 TDD	-	R.12 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA^Note2 OCNG_RB^Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-85.81		-103.85		-116	
	Bands TDD_C						-115	
	Bands TDD_E						-114	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP^Note4	Bands TDD_A	dBm/15 kHz	-82.81	-82.81	-106.75	-106.75	-119.60	-119.60
	Bands TDD_C						-118.60	-118.60
	Bands TDD_E						-117.60	-117.60
RSRQ^Note4	Bands TDD_A, TDD_C, TDD_E	dB	-14.77	-14.77	-16.76	-16.76	-17.12	-17.12
Io^Note4	Bands TDD_A	dBm/9 MHz	-51.05		-73		-85.49	
	Bands TDD_C						-84.49	
	Bands TDD_E						-83.49	
Propagation condition		-	AWGN		AWGN		AWGN	
Correlation Matrix and Antenna Configuration			1x1		1x1		1x1	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: E-UTRA operating band groups are as defined in Section 3.5.

Table 9.2.44.1.5-2: RSRQ FD-FDD Intra frequency absolute accuracy requirements for the reported values for UE category 0

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_02	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_18	RSRQ_16	RSRQ_16
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_21	RSRQ_17	RSRQ_17

9.2.45 4 DL CA PCell in FDD FDD-TDD RSRQ for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.2.45.1 Test purpose

To verify that TDD-FDD RSRQ absolute and relative measurement accuracy in carrier aggregation with PCell in FDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.45.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE Release 12 and forward that support 4DL TDD-FDD CA with FDD as PCell.

9.2.45.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.45.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.45.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.45.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
  - Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
  - $RSRP1,2|_{dBm}$ according to Annex I.3.4 for a corresponding Band
  - $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le 27dB$
  - | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.45.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies. NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.45.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.45.

9.2.45.4 Test description

9.2.45.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.45.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure TBD as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.45.4.3.
4. Cell 1 is PCell in FDD on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, and Cell 4 is SCell on SCC3. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4 shall be powered OFF.

9.2.45.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, and Cell 4) on the SCCs as per TS 36.508 [7] clause 5.2A.4.
4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.45.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

The reported RSRQ values for Cell 1, Cell 2, Cell 3, and Cell 4 are compared to the actual RSRQ values according to Table 9.2.45.5-2. This counts respectively as a Pass or Fail for the events "Cell 1", "Cell 2", "Cell 3", and "Cell 4". If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 3, or Cell 4, the number of failed iterations for the respective event is increased by one.

The reported RSRQ values for Cell 2, Cell 3 and Cell 4 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.45.5-3. These count respectively as a Pass or Fail for the events "Cell 1-2", "Cell 1-3", and "Cell 1-4". If the UE fails to report the measurement value for Cell 2, Cell 3, or Cell 4, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events "Cell 1", "Cell 2", "Cell 3", "Cell 4", "Cell 1-2", "Cell 1-3", and "Cell 1-4" is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.45.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.45.4.3-1: Common Exception messages for 4DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement

TBD

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.45.5 Test requirement

Table 9.2.45.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.45.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.45.5-3.

Table 9.2.45.5-1: 4 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2, Cell #3 and Cell #4)

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4
E-UTRA RF Channel Number			1	2	3	4
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			-	6	6	6
Uplink/downlink configuration Note1			-	1	1	1
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA Note2						
OCNG_RB Note2						
N_{oc} Note3	Bands TDD_A	dBm/15kHz	-	-116+TT	-116+TT	-116+TT
	Bands TDD_C		-	-115+TT	-115+TT	-115+TT
	Bands TDD_E		-	-114+TT	-114+TT	-114+TT
	Bands FDD_A		-119.5+TT	-	-	-
	Bands FDD_B		-119+TT	-	-	-
	Bands FDD_C		-118.5+TT	-	-	-
	Bands FDD_D		-118+TT	-	-	-
	Bands FDD_E, Bands FDD_F Note 6		-117.5+TT	-	-	-
	Bands		-116.5+TT	-	-	-

	FDD_G					
	Bands FDD_H		-116+TT	-	-	-
$\hat{E}_s/N_{oc}$		dB	-6.0+TT	-6.0+TT	-6.0+TT	-6.0+TT
$\hat{E}_s/I_{ot}$		dB	-6.0+TT	-6.0+TT	-6.0+TT	-6.0+TT
RSRP[Note4]	Bands TDD_A	dBm/ 15kHz	-	-122+TT	-122+TT	-122+TT
	Bands TDD_C		-	-121+TT	-121+TT	-121+TT
	Bands TDD_E		-	-120+TT	-120+TT	-120+TT
	Bands FDD_A		-125.5+TT	-	-	-
	Bands FDD_B		-125+TT	-	-	-
	Bands FDD_C		-124.5+TT	-	-	-
	Bands FDD_D		-124+TT	-	-	-
	Bands FDD_E, Bands FDD_F [Note 6]		-123.5+TT	-	-	-
	Bands FDD_G		-122.5+TT	-	-	-
	Bands FDD_H		-122+TT	-	-	-
RSRQ[Note4]	Bands TDD_A	dB	-	-17.77+TT	-17.77+TT	-17.77+TT
	Bands TDD_C					
	Bands TDD_E					
	Bands FDD_A		-17.77+TT	-	-	-
	Bands FDD_B					
	Bands FDD_C					
	Bands FDD_D					
	Bands FDD_E, Bands FDD_F [Note 6]					
	Bands FDD_G					
	Bands FDD_H					
Io[Note4]	Bands TDD_A	dBm/ $BW_{channel}$	-	-87.25 + 10log($N_{RB,c}$/50) +TT	-87.25 + 10log($N_{RB,c}$/50) +TT	-87.25 + 10log($N_{RB,c}$/50) +TT
	Bands TDD_C		-	-86.25 + 10log($N_{RB,c}$/50) +TT	-86.25 + 10log($N_{RB,c}$/50) +TT	-86.25 + 10log($N_{RB,c}$/50) +TT
	Bands TDD_E		-	-85.25 + 10log($N_{RB,c}$/50) +TT	-85.25 + 10log($N_{RB,c}$/50) +TT	-85.25 + 10log($N_{RB,c}$/50) +TT
	Bands FDD_A		-90.75 + 10log($N_{RB,c}$/50) +TT	-	-	-
	Bands FDD_B		-90.25 + 10log($N_{RB,c}$/50) +TT	-	-	-
	Bands		-89.75 +	-	-	-

	FDD_C		$10\log(N_{RB,c}/50)$ +TT			
	Bands FDD_D		-89.25 + $10\log(N_{RB,c}/50)$ +TT	-	-	-
	Bands FDD_E, Bands FDD_F Note 6		-88.75 + $10\log(N_{RB,c}/50)$ +TT	-	-	-
	Bands FDD_G		-87.75 + $10\log(N_{RB,c}/50)$ +TT	-	-	-
	Bands FDD_H		-87.25 + $10\log(N_{RB,c}/50)$ +TT	-	-	-
Propagation Condition			AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2
Timing offset to Cell 1		μs	-	0	0	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10			-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section A.3.6.1.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.45.5-2: RSRQ absolute accuracy requirements for the reported values for 4 DL PCell in FDD for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]

Table 9.2.45.5-3: RSRQ relative accuracy requirements for the reported values for 4 DL PCell in FDD for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.46 4DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.2.46.1 Test purpose

The purpose of this test is to verify that the TDD-FDD RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.46.2 Test applicability

This test case applies to all types of UE Release 12 and forward supporting E-UTRA FDD and TDD and 4DL CA with TDD as PCell.

9.2.46.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.45.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.46.

9.2.46.4 Test description

9.2.46.4.1 Initial conditions

Same initial conditions as in clause 9.2.45.4.1 with the following exceptions:

- Instead of Table 9.2.45.5-1 → use Table 9.2.46.5-1.
- Message contents are defined in clause 9.2.46.4.3.

9.2.46.4.2 Test procedure

Same test procedure as in clause 9.2.45.4.2 with the following exceptions:

- Instead of Table 9.2.45.5-1 → use Table 9.2.46.5-1.
- Instead of Table 9.2.45.5-2 → use Table 9.2.46.5-2.
- Instead of Table 9.2.45.5-3 → use Table 9.2.46.5-3.

9.2.46.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.46.4.3-1: Common Exception messages for 4DL TDD RSRQ Accuracy for E-UTRA Carrier Aggregation test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.46.5 Test requirement

Table 9.2.46.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.46.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.46.5-3.

Table 9.2.46.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute and relative accuracy for Carrier Aggregation

Parameter		Unit	Cell 1	Cell 2	Cell 3	Cell 4
E-UTRA RF Channel Number			1	2	3	4
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100
Special subframe configuration Note1			6	-	-	-
Uplink/downlink configuration Note1			1	-	-	-
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10
OCNG Patterns defined in A.3.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0
N_{oc} Note3	Bands TDD_A	dBm/15kHz	-116+TT	-	-	-
	Bands TDD_C		-115+TT	-	-	-
	Bands TDD_E		-114+TT	-	-	-
	Bands FDD_A		-	-119.5+TT	-119.5+TT	-119.5+TT
	Bands FDD_B		-	-119+TT	-119+TT	-119+TT
	Bands FDD_C		-	-118.5+TT	-118.5+TT	-118.5+TT
	Bands FDD_D		-	-118+TT	-118+TT	-118+TT
	Bands FDD_E, Bands FDD_F Note 6		-	-117.5+TT	-117.5+TT	-117.5+TT
	Bands		-	-116.5+TT	-116.5+TT	-116.5+TT

	FDD_G					
	Bands FDD_H		-	-116+TT	-116+TT	-116+TT
$\hat{E}_s/N_{oc}$		dB	-6.0+TT	-6.0+TT	-6.0+TT	-6.0+TT
$\hat{E}_s/I_{ot}$		dB	-6.0+TT	-6.0+TT	-6.0+TT	-6.0+TT
RSRP Note4	Bands TDD_A	dBm/15kHz	-122	-	-	-
	Bands TDD_C		-121	-	-	-
	Bands TDD_E		-120	-	-	-
	Bands FDD_A		-	-125.5	-125.5	-125.5
	Bands FDD_B		-	-125	-125	-125
	Bands FDD_C		-	-124.5	-124.5	-124.5
	Bands FDD_D		-	-124	-124	-124
	Bands FDD_E, Bands FDD_F Note 6		-	-123.5	-123.5	-123.5
	Bands FDD_G		-	-122.5	-122.5	-122.5
	Bands FDD_H		-	-122	-122	-122
RSRQ Note4	Bands TDD_A	dB	-17.77	-	-	-
	Bands TDD_C					
	Bands TDD_E					
	Bands FDD_A		-	-17.77	-17.77	-17.77
	Bands FDD_B					
	Bands FDD_C					
	Bands FDD_D					
	Bands FDD_E, Bands FDD_F Note 6					
	Bands FDD_G					
	Bands FDD_H					
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-87.25 + $10\log(N_{RB,c}/50)$	-	-	-
	Bands TDD_C		-86.25 + $10\log(N_{RB,c}/50)$	-	-	-
	Bands TDD_E		-85.25 + $10\log(N_{RB,c}/50)$	-	-	-
	Bands FDD_A		-	-90.75 + $10\log(N_{RB,c}/50)$	-90.75 + $10\log(N_{RB,c}/50)$	-90.75 + $10\log(N_{RB,c}/50)$
	Bands FDD_B		-	-90.25 + $10\log(N_{RB,c}/50)$	-90.25 + $10\log(N_{RB,c}/50)$	-90.25 + $10\log(N_{RB,c}/50)$
	Bands FDD_C		-	-89.75 + $10\log(N_{RB,c}/50)$	-89.75 + $10\log(N_{RB,c}/50)$	-89.75 + $10\log(N_{RB,c}/50)$
	Bands FDD_D		-	-89.25 + $10\log(N_{RB,c}/50)$	-89.25 + $10\log(N_{RB,c}/50)$	-89.25 + $10\log(N_{RB,c}/50)$
	Bands FDD_E,		-	-88.75 + $10\log(N_{RB,c}/50)$	-88.75 + $10\log(N_{RB,c}/50)$	-88.75 + $10\log(N_{RB,c}/50)$

	Bands FDD_F Note 6					
	Bands FDD_G		-	-87.75 + 10log($N_{RB,c}$/50)	-87.75 + 10log($N_{RB,c}$/50)	-87.75 + 10log($N_{RB,c}$/50)
	Bands FDD_H		-	-87.25 + 10log($N_{RB,c}$/50)	-87.25 + 10log($N_{RB,c}$/50)	-87.25 + 10log($N_{RB,c}$/50)
Propagation Condition			AWGN	AWGN	AWGN	AWGN
Antenna Configuration			1x2	1x2	1x2	1x2
Timing offset to Cell 1		µs	-	0	0	0
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10			-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: Void.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.46.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]

Table 9.2.46.5-3: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Event	All bands

Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.47 5 DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.2.47.1 Test purpose

To verify that TDD-FDD RSRQ absolute and relative measurement accuracy in carrier aggregation with PCell in FDD are within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.47.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD UE Release 12 and forward that support 5DL TDD-FDD CA with FDD as PCell.

9.2.47.3 Minimum conformance requirements

The RSRQ measurements of cells on the primary component carrier shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1. The RSRQ measurements of cells on any of the secondary component carrier(s) shall meet the intra-frequency absolute accuracy requirements defined in TS 36.133 [4] clause 9.1.5.1.

The accuracy requirements in Table 9.2.47.3-1 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
- Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
- RSRP|dBm according to Annex I.3.1 for a corresponding Band

Table 9.2.47.3-1: RSRQ Intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.

When measurements of cells on the primary component carrier are compared with measurements of cells on any of the secondary component carrier(s), the applicable relative accuracy requirements are the RSRQ inter-frequency accuracy requirements defined in TS 36.133 [4] clause 9.1.6.2.

The accuracy requirements in Table 9.2.47.3-2 are valid under the following conditions:

- Cell specific reference signals are transmitted either from one, two or four antenna ports.
  - Conditions defined in 36.101 [2] Clause 7.3 for reference sensitivity are fulfilled.
  - RSRP1,2$|_{dBm}$ according to Annex I.3.4 for a corresponding Band
  - $\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$
  - | Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.2.47.3-2: RSRQ Inter frequency relative accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot Note 2	E-UTRA operating band groups Note 5	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 4	dBm/BW$_{Channel}$
±3	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±4	±4	≥-6 dB	Note 3	Note 3	Note 3

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.
NOTE 3: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
NOTE 4: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 5: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution. The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.47.3-3: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.47.

9.2.47.4 Test description

9.2.47.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1 for different CA bandwidth classes.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.47.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure [TBD] as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.47.4.3.
4. Cell 1 is PCell in FDD on the primary component carrier, Cell 2 is SCell on SCC1, Cell 3 is SCell on SCC2, Cell 4 is SCell on SCC3 and Cell 5 is SCell on SCC4. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2, Cell 3, Cell 4, and Cell 5 shall be powered OFF.

9.2.47.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCells (Cell 2, Cell 3, Cell 4, and Cell 5) on the SCCs as per TS 36.508 [7] clause 5.2A.4.
4. The SS activates SCCs by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
5. Set the parameters according to Table 9.2.47.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.
6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.
8. The UE shall transmit periodically MeasurementReport messages.
9. After 10s wait from Step 6, the SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 1, Cell 2, Cell 3, Cell 4, and Cell 5 are compared to the actual RSRQ values according to Table 9.2.47.5-2. This counts respectively as a Pass or Fail for the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, and “Cell 5”. If the UE fails to report the measurement value for Cell 1, Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

   The reported RSRQ values for Cell 2, Cell 3, Cell 4, and Cell 5 are compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.47.5-3. These count respectively as a Pass or Fail for the events “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, and “Cell 1-5”. If the UE fails to report the measurement value for Cell 2, Cell 3, Cell 4, or Cell 5, the number of failed iterations for the respective event is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

    Each of the events “Cell 1”, “Cell 2”, “Cell 3”, “Cell 4”, “Cell 5”, “Cell 1-2”, “Cell 1-3”, “Cell 1-4”, and “Cell 1-5” is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If all events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.47.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.47.4.3-1: Common Exception messages for 5DL PCell in FDD RSRQ for E-UTRAN Carrier Aggregation test requirement (TBD)

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.47.5 Test requirement

Table 9.2.47.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.47.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.47.5-3.

Table 9.2.47.5-1: 5DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation test parameters (Cell #1, Cell #2, Cell #3, Cell #4, and Cell #5)

Parameter		Unit	Cell 1	Cells			
				2	**3**	**4**	**5**
E-UTRA RF Channel Number			1	2	3	4	5
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
Special subframe configuration[Note1]			-	6			
Uplink/downlink configuration[Note1]			-	1			
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52			
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD			
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61			
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD			
OCNG Patterns defined in A.3.2			5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD			
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0			
N_{oc} [Note3]	Bands TDD_A	dBm/ 15kHz	-	-116+TT			
	Bands TDD_C		-	-115+TT			
	Bands TDD_E		-	-114+TT			
	Bands FDD_A		-119.5+TT	-			
	Bands FDD_B		-119+TT	-			
	Bands FDD_C		-118.5+TT	-			
	Bands FDD_D		-118+TT	-			
	Bands FDD_E, Bands FDD_F Note 6		-117.5+TT	-			
	Bands FDD_G		-116.5+TT	-			
	Bands FDD_H		-116+TT	-			
$\hat{E}_s/N_{oc}$		dB	-6.0+TT	-6.0+TT			
$\hat{E}_s/I_{ot}$		dB	-6.0+TT	-6.0+TT			
RSRP[Note4]	Bands TDD_A	dBm/ 15kHz	-	-122			
	Bands TDD_C		-	-121			
	Bands TDD_E		-	-120			
	Bands FDD_A		-125.5	-			
	Bands FDD_B		-125	-			
	Bands FDD_C		-124.5	-			
	Bands FDD_D		-124	-			
	Bands FDD_E,		-123.5	-			

	Bands FDD_F Note 6						
	Bands FDD_G		-122.5	-			
	Bands FDD_H		-122	-			
RSRQ Note4	Bands TDD_A	dB	-	-17.77			
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-17.77	-			
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D						
	Bands FDD_E, Bands FDD_F Note 6						
	Bands FDD_G						
	Bands FDD_H						
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-	-87.25 + 10log($N_{RB,c}$/50)			
	Bands TDD_C		-	-86.25 + 10log($N_{RB,c}$/50)			
	Bands TDD_E		-	-85.25 + 10log($N_{RB,c}$/50)			
	Bands FDD_A		-90.75 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_B		-90.25 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_C		-89.75 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_D		-89.25 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_E, Bands FDD_F Note 6		-88.75 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_G		-87.75 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_H		-87.25 + 10log($N_{RB,c}$/50)	-			
Propagation Condition			AWGN	AWGN			
Antenna Configuration			1x2	1x2			
Timing offset to Cell 1		µs	-	0			
Time alignment error relative to cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 2 Note 10			-	-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to cell 3 Note 10			-	-	-	≤ TAE	≤ TAE
Time alignment error relative to cell 4 Note 10			-	-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.47.5-2: RSRQ absolute accuracy requirements for the reported values for 5 DL PCell in FDD for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]
Lowest reported value (Cell 5)	Cell 5	RSRQ_[TBD]
Highest reported value (Cell 5)		RSRQ_[TBD]
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]
Lowest reported value (Cell 5)	Cell 5	RSRQ_[TBD]
Highest reported value (Cell 5)		RSRQ_[TBD]

Table 9.2.47.5-3: RSRQ relative accuracy requirements for the reported values for 5 DL PCell in FDD for E-UTRAN in Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x + [TBD]
Highest reported value (Cell 5)		RSRQ_x + [TBD]
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x + [TBD]
Highest reported value (Cell 5)		RSRQ_x + [TBD]
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.48 5 DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation

Editor's Note: This test case is incomplete. The following items are missing or are incomplete:

- Test tolerances are undefined

- Connection Diagram is undefined in TS 36.508

- Message contents are undefined

9.2.48.1 Test purpose

The purpose of this test is to verify that the TDD-FDD RSRQ measurement accuracy in carrier aggregation is within the specified limits under AWGN propagation conditions. This test will verify the absolute accuracy of intra-frequency RSRQ measurements for the primary component carrier, the absolute accuracy of intra-frequency RSRQ measurements for the secondary component carrier, and also the relative inter-frequency RSRQ accuracy requirement between primary and secondary component carriers.

9.2.48.2 Test applicability

This test case applies to all types of UE Release 12 and forward supporting E-UTRA FDD and TDD and 5DL CA with TDD as PCell.

9.2.48.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 9.2.47.3.

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.5.1, 9.1.6.2, 9.1.7, 9.1.11, and A.9.2.47.

9.2.48.4 Test description

9.2.48.4.1 Initial conditions

Same initial conditions as in clause 9.2.47.4.1 with the following exceptions:

- Instead of Table 9.2.47.5-1 → use Table 9.2.48.5-1.
- Message contents are defined in clause 9.2.48.4.3.

9.2.48.4.2 Test procedure

Same test procedure as in clause 9.2.47.4.2 with the following exceptions:

- Instead of Table 9.2.47.5-1 → use Table 9.2.48.5-1.
- Instead of Table 9.2.47.5-2 → use Table 9.2.48.5-2.
- Instead of Table 9.2.47.5-3 → use Table 9.2.48.5-3.

9.2.48.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.48.4.3-1: Common Exception messages for 5DL TDD RSRQ Accuracy for E-UTRA Carrier Aggregation test requirement (TBD)

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-8 Table H.4.2-6

9.2.48.5 Test requirement

Table 9.2.48.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.48.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.48.5-3.

Table 9.2.48.5-1: Cell Specific Test requirement Parameters for TDD RSRQ absolute and relative accuracy for Carrier Aggregation

Parameter		Unit	Cell 1	Cells 2	Cells 3	Cells 4	Cells 5
E-UTRA RF Channel Number			1	2	3	4	5
$BW_{channel}$			5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100			
Special subframe configuration[Note1]			6	-			
Uplink/downlink configuration[Note1]			1	-			
Measurement bandwidth		n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52			
PDSCH Reference measurement channel defined in A.3.1.1			5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD			
PDSCH allocation		n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61			
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2			5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD			
OCNG Patterns defined in A.3.2			5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD			
PBCH_RA		dB	0	0			
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA[Note2]							
OCNG_RB[Note2]							
N_{oc} [Note3]	Bands TDD_A	dBm/ 15kHz	-116+TT	-			
	Bands TDD_C		-115+TT	-			
	Bands TDD_E		-114+TT	-			
	Bands FDD_A		-	-119.5+TT			
	Bands FDD_B		-	-119+TT			
	Bands FDD_C		-	-118.5+TT			
	Bands FDD_D		-	-118+TT			
	Bands FDD_E, Bands FDD_F Note 6		-	-117.5+TT			
	Bands FDD_G		-	-116.5+TT			
	Bands FDD_H		-	-116+TT			
$\hat{E}_s/N_{oc}$		dB	-6.0+TT	-6.0+TT			
$\hat{E}_s/I_{ot}$		dB	-6.0+TT	-6.0+TT			
RSRP[Note4]	Bands TDD_A	dBm/ 15kHz	-122	-			
	Bands TDD_C		-121	-			
	Bands TDD_E		-120	-			
	Bands FDD_A		-	-125.5			
	Bands FDD_B		-	-125			
	Bands FDD_C		-	-124.5			
	Bands FDD_D		-	-124			
	Bands FDD_E,		-	-123.5			

	Bands FDD_F Note 6						
	Bands FDD_G		-	-122.5			
	Bands FDD_H		-	-122			
RSRQ Note4	Bands TDD_A	dB	-17.77	-			
	Bands TDD_C						
	Bands TDD_E						
	Bands FDD_A		-	-17.77			
	Bands FDD_B						
	Bands FDD_C						
	Bands FDD_D						
	Bands FDD_E, Bands FDD_F Note 6						
	Bands FDD_G						
	Bands FDD_H						
Io Note4	Bands TDD_A	dBm/ $BW_{channel}$	-87.25 + 10log($N_{RB,c}$/50)	-			
	Bands TDD_C		-86.25 + 10log($N_{RB,c}$/50)	-			
	Bands TDD_E		-85.25 + 10log($N_{RB,c}$/50)	-			
	Bands FDD_A		-	-90.75 + 10log($N_{RB,c}$/50)			
	Bands FDD_B		-	-90.25 + 10log($N_{RB,c}$/50)			
	Bands FDD_C		-	-89.75 + 10log($N_{RB,c}$/50)			
	Bands FDD_D		-	-89.25 + 10log($N_{RB,c}$/50)			
	Bands FDD_E, Bands FDD_F Note 6		-	-88.75 + 10log($N_{RB,c}$/50)			
	Bands FDD_G		-	-87.75 + 10log($N_{RB,c}$/50)			
	Bands FDD_H		-	-87.25 + 10log($N_{RB,c}$/50)			
Propagation Condition			AWGN	AWGN			
Antenna Configuration			1x2	1x2			
Timing offset to Cell 1		µs	0	-			
Time alignment error relative to Cell 1 Note 10			-	≤ TAE	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to Cell 2 Note 10			-	-	≤ TAE	≤ TAE	≤ TAE
Time alignment error relative to Cell 3 Note 10			-	-	-	≤ TAE	≤ TAE
Time alignment error relative to Cell 4 Note 10			-	-	-	-	≤ TAE

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz.
Note 7: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 8: Void.
Note 9: E-UTRA operating band groups are as defined in Section 3.5.
Note 10: Time alignment error (TAE) as specified in TS 36.104 [30] clause 6.5.3.1. The TAE value depends upon the type of carrier aggregation.

Table 9.2.48.5-2: TDD RSRQ absolute accuracy requirements for the reported values for Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]
Lowest reported value (Cell 5)	Cell 5	RSRQ_[TBD]
Highest reported value (Cell 5)		RSRQ_[TBD]
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 1	RSRQ_[TBD]
Highest reported value Cell 1)		RSRQ_[TBD]
Lowest reported value (Cell 2)	Cell 2	RSRQ_[TBD]
Highest reported value (Cell 2)		RSRQ_[TBD]
Lowest reported value (Cell 3)	Cell 3	RSRQ_[TBD]
Highest reported value (Cell 3)		RSRQ_[TBD]
Lowest reported value (Cell 4)	Cell 4	RSRQ_[TBD]
Highest reported value (Cell 4)		RSRQ_[TBD]
Lowest reported value (Cell 5)	Cell 5	RSRQ_[TBD]
Highest reported value (Cell 5)		RSRQ_[TBD]

Table 9.2.48.5-3: TDD RSRQ relative accuracy requirements for the reported values for Carrier Aggregation

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x + [TBD]
Highest reported value (Cell 5)		RSRQ_x + [TBD]
Extreme Conditions		
Lowest reported value (Cell 2)	Cell 1-2	RSRQ_x + [TBD]
Highest reported value (Cell 2)		RSRQ_x + [TBD]
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x + [TBD]
Highest reported value (Cell 3)		RSRQ_x + [TBD]
Lowest reported value (Cell 4)	Cell 1-4	RSRQ_x + [TBD]
Highest reported value (Cell 4)		RSRQ_x + [TBD]
Lowest reported value (Cell 5)	Cell 1-5	RSRQ_x + [TBD]
Highest reported value (Cell 5)		RSRQ_x + [TBD]
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.49 to 9.2.50

9.2.51 FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- The relative RSRQ accuracy minimum requirements is not specified in TS36.133 clause 9.1.19.2

- Several signal values in test parameter table is within brackets

- OCNG patterns is TBD

- Test Tolerance is TBD

- Test system uncertainties is TBD

9.2.51.1 Test purpose

The purpose of this test is to verify that the FDD intra frequency RSRQ absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRQ accuracy requirement of the secondary component carrier defined in clause 9.1.19.2 of TS36.133. The test will also verify the primary and secondary component carrier relative RSRQ accuracy requirement defined in Clause 9.1.19.2 of TS36.133.

9.2.51.2 Test applicability

This test applies to all types of E-UTRA FDD and TDD FS3 UE Release 13 and forward that support CA with FDD as PCell.

9.2.51.3 Minimum conformance requirements

The requirements in this section are for the measurements on cells of E-UTRA carriers operated under frame structure 3 on one SCC.

Absolute RSRQ measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.3.4 in TS36.133.

The accuracy requirements in Table 9.2.51.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.2 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.2.51.3-1: RSRQ intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/$BW_{Channel}$
[±2.5]	[±4]	≥-3 dB	FS3_G	-118	-50
[±3.5]	[±4]	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

NOTE 1: The relative RSRQ accuracy minimum requirements is not specified in TS 36.133 clause 9.1.19.2

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7-1: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE 2: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS36.306[14].

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.19.2, 9.1.19.3 and A.9.2.51.

9.2.51.4 Test description

9.2.51.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.51.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1 Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.41 as appropriate.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.51.4.3.

4. Cell 1 is PCell in FDD on the primary component carrier, Cell 2 is SCell on SCC1 with frame structure 3, and Cell 3 is a neighbouring cell on the same CC as Cell2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.51.4.2 Test procedure

In this test case, Cell1 is PCell on the primary component carrier, Cell2 is SCell on the secondary component carrier with frame structure 3 and activated, and Cell3 is the neighbouring cell on the same secondary component carrier of Cell2. The test parameters are given in Table 9.2.51.5-1. The DMTC configuration for Cell2 and Cell3 is provided to the UE in the *measDS-Config* before the start of the test in test procedure step 8.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.

3. The SS shall configure SCell (Cell2) on the SCC as per TS 36.508 [7] clause 5.2A.4.

4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.51.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages.

   The reported RSRQ values for Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.51.5-2. This counts respectively as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 1, the number of failed iterations for the respective event ”Cell 3” is increased by one.

   The reported RSRQ values for Cell3 are compared to the reported RSRQ value for other cells for each MeasurementReport message according to Table 9.2.51.5-3. These count respectively as a Pass or Fail for the event “Cell 1-3”. If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 1-3”, is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If both events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.51.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.51.4.3-1: Common Exception messages for FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.51.4.3-2: *MeasDS-Config*: Additional Exception messages for FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirement

Derivation Path: 36.508, clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
Ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
	1		LAA SCell
}			
measCSI-RS-ToRemoveList-r12	Not present		
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Config-r12 {			
	Not present		
}			
}			
}			

9.2.51.5 Test requirement

Table 9.2.51.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.51.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.51.5-3.

Table 9.2.51.5-1: Test parameters for FDD RSRQ accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	Cell 2	Cell3
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	[40]	[40]
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	[A.3.17]
Timing offset to cell1	µs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	[47-52]	[47-52]
PDSCH Reference measurement channel defined in A.3.1.1		5MHz: R.5 FDD 10MHz: R.0 FDD 20MHz: R.4 FDD	[R.0 FS3]	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2		5MHz: R.11 FDD 10MHz: R.6 FDD 20MHz: R.10 FDD	[R.0 FS3]	[R.0 FS3]
OCNG Patterns defined in A.3.2		5MHz: OP.15 FDD 10MHz: OP.1 FDD 20MHz: OP.11 FDD	[TBD]	[TBD]
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				

PDSCH_RB					
OCNG_RA Note1					
OCNG_RB Note1					
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-119.5	-	
	Bands FDD_B		-119		
	Bands FDD_C		-118.5		
	Bands FDD_D		-118		
	Bands FDD_E, FDD_F Note 6		-117.5		
	Bands FDD_G		-116.5		
	Bands FDD_H		-116		
	Bands FS3_G		-	[(N_{oc} for Channel 1 +3.5dB)]	
$\hat{E}_s/I_{ot}$		dB	[-4]	[-5.46Note9]	[-5.46]
RSRPNote3	Bands FDD_A	dBm/15 kHz	[-123.5]	-	
	Bands FDD_B		[-123]		
	Bands FDD_C		[-122.5]		
	Bands FDD_D		[-122]		
	Bands FDD_E, FDD_F Note 6		[-121.5]		
	Bands FDD_G		[-120.5]		
	Bands FDD_H		[-120]		
	Bands FS3_G		-	[(RSRP for Cell 1 +3.5dB)]	[(RSRP for Cell 1 +3.5dB)]
RSRQNote3	Bands FDD_A	dBm/15 kHz	[-16.25]	-	
	Bands FDD_B				
	Bands FDD_C				
	Bands FDD_D				
	Bands FDD_E, FDD_F Note 6				
	Bands FDD_G				
	Bands FDD_H				
	Bands FS3_G		-	[-17.34Note9]	[-17.34]
IoNote3	Bands FDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	[-90.26 +10log($N_{RB,c}$/50)]	-	
	Bands FDD_B		[-89.76 +10log($N_{RB,c}$/50)]		
	Bands FDD_C		[-89.26 +10log($N_{RB,c}$/50)]		
	Bands FDD_D		[-88.76 +10log($N_{RB,c}$/50)]		
	Bands FDD_E, FDD_F Note 6		[-88.26 +10log($N_{RB,c}$/50)]		
	Bands FDD_G		[-87.26 +10log($N_{RB,c}$/50)]		
	Bands FDD_H		[-86.76 +10log($N_{RB,c}$/50)]		
	Bands FS3_G		-	[(Io for Channel 1 +4.59dBNote9)]	[(Io for Channel 1 +4.59dB)]
$\hat{E}_s/N_{oc}$		dB	[-4]	[-4]	[-4]
Propagation condition		-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate					

	power for N_{oc} to be fulfilled.
Note 3:	RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 6:	For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz
Note 7:	This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8:	E-UTRA operating band groups are as defined in Section 3.5.
Note 9:	The value is corresponding to DRS transmission through LBT operation in Cell3.

Table 9.2.51.5-2: RSRQ absolute accuracy requirements for the reported values for FDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 3	RSRQ_7-TT
Highest reported value Cell 1)		RSRQ_7+TT
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 3	RSRQ_8-TT
Highest reported value Cell 1)		RSRQ_8+TT

Table 9.2.51.5-3: RSRQ relative accuracy requirements for the reported values for FDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10+TT
Highest reported value (Cell 3)		RSRQ_x + 10+TT
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10+TT
Highest reported value (Cell 3)		RSRQ_x + 10+TT
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.52 TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3

Editor's notes: This test is incomplete. The following aspects are either missing or not yet determined:

- The relative RSRQ accuracy minimum requirements is not specified in TS36.133 clause 9.1.19.2

- Several signal values in test parameter table is within brackets

- OCNG patterns is TBD

- Test Tolerance is TBD

- Test system uncertainties is TBD

9.2.52.1 Test purpose

The purpose of this test is to verify that the TDD intra frequency RSRQ absolute and relative measurement accuracies in carrier aggregation with frame structure 3 in the configured DMTC occasion are within the specified limits. This test will verify the absolute RSRQ accuracy requirement of the secondary component carrier defined in clause 9.1.19.2 of TS36.133. The test will also verify the primary and secondary component carrier relative RSRQ accuracy requirement defined in Clause 9.1.19.2 of TS36.133.

9.2.52.2 Test applicability

This test applies to all types of E-UTRA TDD and TDD FS3 UE Release 13 and forward that support CA with TDD as PCell.

9.2.52.3 Minimum conformance requirements

The requirements in this section are for the measurements on cells of E-UTRA carriers operated under frame structure 3 on one SCC.

Absolute RSRQ measurements of cells on SCC shall meet the intra-frequency absolute accuracy requirements in Section 9.1.18.3.4 in TS36.133.

The accuracy requirements in Table 9.2.52.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.21.2 for a corresponding Band.

The discovery signal occasion does not contain any MBSFN subframe and contains at least four CRS symbols over two adjacent slots.

Table 9.2.52.3-1: RSRQ intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	dBm/BW$_{Channel}$
[±2.5]	[±4]	≥-3 dB	FS3_G	-118	-50
[±3.5]	[±4]	≥-6 dB	Note 2	Note 2	Note 2
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 4: E-UTRA operating band groups are as defined in Section 3.5.					

NOTE 1: The relative RSRQ accuracy minimum requirements is not specified in TS 36.133 clause 9.1.19.2

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 9.2.52.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.52.3-2: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_-30	RSRQ < -34	dB
RSRQ_-29	-34 ≤ RSRQ < -33.5	dB
…	…	…
RSRQ_-02	-20.5 ≤ RSRQ < -20	dB
RSRQ_-01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
…	…	…
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

NOTE 2: The ranges from RSRQ_-30 to RSRQ_-01 and from RSRQ_35 to RSRQ_46 apply for the UE who can support extended RSRQ range in TS36.306[14].

The normative reference for this requirement is TS 36.133 [4] clauses 9.1.19.2, 9.1.19.3 and A.9.2.52.

9.2.52.4 Test description

9.2.52.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-2 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: The largest aggregated bandwidth combination supported by UE from Table 9.2.52.5-1 as defined in TS 36.508 [7] clause 4.3.1 for different CA configurations as defined in TS 36.521-1 [10] clause 5.4.2A.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.41 as appropriate.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.52.4.3.
4. Cell 1 is PCell in TDD on the primary component carrier, Cell 2 is SCell on SCC1 with frame structure 3, and Cell 3 is a neighbouring cell on the same CC as Cell2. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test. Cell 2 and Cell 3 shall be powered OFF.

9.2.52.4.2 Test procedure

In this test case, Cell1 is PCell on the primary component carrier, Cell2 is SCell on the secondary component carrier with frame structure 3 and activated, and Cell3 is the neighbouring cell on the same secondary component carrier of Cell2. The test parameters are given in Table 9.2.52.5-1. The DMTC configuration for Cell2 and Cell3 is provided to the UE in the *measDS-Config* before the start of the test in test procedure step 8.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.
2. Configure SCells according to Annex C.0 and C.1 for all downlink physical channels.
3. The SS shall configure SCell (Cell2) on the SCC as per TS 36.508 [7] clause 5.2A.4.
4. The SS activates SCC by sending the MAC-CE according to TS 36.321 [11] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.

5. Set the parameters according to Table 9.2.52.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.

6. The SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

7. The UE shall transmit an RRCConnectionReconfigurationComplete message.

8. The UE shall transmit periodically MeasurementReport messages.

9. After 10s wait from Step 6, SS shall check the reported RSRQ values in periodical MeasurementReport messages.
   The reported RSRQ values for Cell 3 by the UE are compared to the actual RSRQ values according to Table 9.2.52.5-2. This counts respectively as a Pass or Fail for the events “Cell 3”. If the UE fails to report the measurement value for Cell 1, the number of failed iterations for the respective event "Cell 3" is increased by one.
   The reported RSRQ values for Cell3 are compared to the reported RSRQ value for other cells for each MeasurementReport message according to Table 9.2.52.5-3. These count respectively as a Pass or Fail for the event "Cell 1-3". If the UE fails to report the measurement value for Cell 3, the number of failed iterations is increased by one.

10. The SS shall check the MeasurementReport messages transmitted by the UE until a test verdict has been achieved.

Each of the events “Cell 3”, “Cell 1-3”, is evaluated independently for the statistic, resulting in an event verdict: pass or fail. Each event is evaluated only until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved. Different events may require different times for a verdict.

If both events pass for each scenario, the test passes. If one event fails, the test fails.

9.2.52.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.2.52.4.3-1: Common Exception messages for TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-4 Table H.4.1-5 Table H.4.2-1

Table 9.2.52.4.3-2: *MeasDS-Config*: Additional Exception messages for TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3 test requirement

Derivation Path: 36.508, clause 4.6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasDS-Config-DEFAULT ::= CHOICE {			
release	NULL		
setup SEQUENCE {			
dmtc-PeriodOffset-r12 CHOICE {			
ms40-r12	10		
}			
ds-OccasionDuration-r12 CHOICE {			
	1		LAA SCell
}			
measCSI-RS-ToRemoveList-r12	Not present		
measCSI-RS-ToAddModList-r12 SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Config-r12 {			
	Not present		
}			
}			
}			

9.2.52.5 Test requirement

Table 9.2.52.5-1 defines the primary level settings including test tolerances for all tests.

The RSRQ absolute accuracy shall meet the reported values test requirements in Table 9.2.52.5-2.

The RSRQ relative accuracy shall meet the reported values test requirements in Table 9.2.52.5-3.

Table 9.2.52.5-1: Test parameters for TDD RSRQ accuracies of Scell with FS3

Parameter	Unit	Test 1		
		Cell 1	**Cell 2**	**Cell3**
E-UTRA RF Channel Number		1	2	2
$BW_{channel}$	MHz	5MHz: $N_{RB,c}$ = 25 10MHz: $N_{RB,c}$ = 50 20MHz: $N_{RB,c}$ = 100	20	20
DMTC period	ms	N/A	[40]	[40]
DMTC period offset		N/A	10	10
Discovery signal occasion duration	ms	N/A	1	1
LBT model		N/A	N/A	[A.3.17]
Special subframe configuration[Note1]		6	N/A	N/A
Uplink/downlink configuration[Note1]		1	N/A	N/A
Timing offset to cell1	µs	-	0	3
Time alignment error between cell 2 and cell 1		-	≤ Time alignment error as specified in 3GPP TS 36.104 [30] clause 6.5.3.1.	-
Measurement bandwidth	n_{PRB}	5MHz: 10-15 10MHz: 22-27 20MHz: 47-52	[47-52]	[47-52]
PDSCH Reference measurement channel defined in A.3.1.1		5MHz: R.4 TDD 10MHz: R.0 TDD 20MHz: R.3 TDD	[R.0 FS3]	-
PDSCH allocation	n_{PRB}	5MHz: 7-17 10MHz: 13-36 20MHz: 38-61	38-61	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2		5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	[R.0 FS3]	[R.0 FS3]
OCNG Patterns defined in A.3.2		5MHz: OP.9 TDD 10MHz: OP.1 TDD 20MHz: OP.7 TDD	[TBD]	[TBD]
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA	dB	0	0	0

PDSCH_RB					
OCNG_RA Note2					
OCNG_RB Note2					
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-119.5	-	
	Bands TDD_C		-118.5		
	Bands TDD_E		-117.5		
	Bands FS3_G		-	[(N_{oc} for Channel 1 +3.5dB)]	
$\hat{E}_s/I_{ot}$		dB	[-4]	[-5.52Note9]	[-5.52]
RSRPNote4	Bands TDD_A	dBm/15 kHz	[-123.5]	-	
	Bands TDD_C		[-122.5]		
	Bands TDD_E		[-121.5]		
	Bands FS3_G		-	[(RSRP for Cell 1 +3.5dB)]	[(RSRP for Cell 1 +3.5dB)]
RSRQNote4	Bands TDD_A	dBm/15 kHz	[-16.25]	-	
	Bands TDD_C				
	Bands TDD_E				
	Bands FS3_G		-	[-17.34 Note9]	[-17.34]
IoNote4	Bands TDD_A	5MHz: dBm/4.5MHz 10MHz: dBm/9MHz 20MHz: dBm/18MHz	[-90.26 +10log($N_{RB,c}$/50)]	-	
	Bands TDD_C		[-89.26 +10log($N_{RB,c}$/50)]		
	Bands TDD_E		[-88.26 +10log($N_{RB,c}$/50)]		
	Bands FS3_G		-	[(Io for Channel 1 +4.59dBNote9)]	[(Io for Channel 1 +4.59dB)]
$\hat{E}_s/N_{oc}$		dB	[-4]	[-4]	[-4]
Propagation condition		-	AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6: The selection of the bands for testing depends on the configuration of the carrier aggregation supported by the UEs.
Note 7: This test verifies the RRM requirement which is independent of channel bandwidth and is performed according to the principle defined in section C.3.3.1.
Note 8: E-UTRA operating band groups are as defined in Section 3.5.
Note 9: The value is corresponding to DRS transmission through LBT operation in Cell3.

Table 9.2.52.5-2: RSRQ absolute accuracy requirements for the reported values for TDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 1)	Cell 3	RSRQ_7-TT
Highest reported value Cell 1)		RSRQ_7+TT
Extreme Conditions		
Lowest reported value (Cell 1)	Cell 3	RSRQ_8-TT
Highest reported value Cell 1)		RSRQ_8+TT

Table 9.2.52.5-3: RSRQ relative accuracy requirements for the reported values for TDD RSRQ accuracies of Scell with FS3

	Event	All bands
Normal Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10+TT
Highest reported value (Cell 3)		RSRQ_x + 10+TT
Extreme Conditions		
Lowest reported value (Cell 3)	Cell 1-3	RSRQ_x – 10+TT
Highest reported value (Cell 3)		RSRQ_x + 10+TT
RSRQ_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.3 UTRA FDD CPICH RSCP

9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy

9.3.1.1 Test purpose

To verify that the CPICH RSCP absolute measurement accuracy is within the specified limits.

9.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

9.3.1.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH RSCP.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.3.1.3-1.

Table 9.3.1.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	Io range		
		UTRA operating bands	Minimum Io	Maximum Io
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz
±6	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70
		Band IX	-93	-70
		Band II, V and VII	-92	-70
		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70
		Band XXV, XXVI Note 1	-90.5	-70
±8	±11	Note 2	-70	-50
NOTE 1: For Band XXVI, the condition has the minimum Io of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies. NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.				

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.1.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV_-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV_-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV_89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV_90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV_91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.1.2 and 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.1.

9.3.1.4 Test description

9.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.1.4.3.

5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.1.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.3.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.3.1.5-1 and 9.3.1.5-2 for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit a RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit a RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check CPICH_RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.3.1.5-3 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Set the parameters according to Tables 9.3.1.5-1 and 9.3.1.5-2 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.3.1.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.3.1.4.3-2: *MeasResults*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.3.1.4.3-3: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

Table 9.3.1.4.3-4: *QuantityConfig-DEFAULT*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigUTRA SEQUENCE {			
measQuantityUTRA-FDD	cpich-RSCP		
filterCoefficient	fc0		
}			

9.3.1.5 Test requirement

The test parameters are given in Tables 9.3.1.4.1-1, 9.3.1.5-1 and 9.3.1.5-2 as below. Table 9.3.1.5-2 and 9.3.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.3.1.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	

PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{E}_s/I_{ot}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
$\hat{E}_s/N_{oc}$	dB	4
Propagation Condition		AWGN
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 9.3.1.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th>Test 1</th><th>Test 2</th></tr>
<tr><th>Cell 2</th><th>Cell 2</th></tr>
<tr><td colspan="2">CPICH_Ec/Ior</td><td>dB</td><td>-10</td><td>-10</td></tr>
<tr><td colspan="2">PCCPCH_Ec/Ior</td><td>dB</td><td>-12</td><td>-12</td></tr>
<tr><td colspan="2">SCH_Ec/Ior</td><td>dB</td><td>-12</td><td>-12</td></tr>
<tr><td colspan="2">PICH_Ec/Ior</td><td>dB</td><td>-15</td><td>-15</td></tr>
<tr><td colspan="2">DPCH_Ec/Ior</td><td>dB</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">OCNS_Ec/Ior</td><td>dB</td><td>-0.94</td><td>-0.94</td></tr>
<tr><td rowspan="5">Ioc</td><td>Band I, IV, VI, X, XI, XIX, XXI</td><td rowspan="5">dBm/3.84 MHz</td><td rowspan="5">-60.75</td><td>-93.76</td></tr>
<tr><td>Band II, V, VII</td><td>-91.76</td></tr>
<tr><td>Band XXV, XXVI</td><td>-90.26 (Note 3)</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV, XX, XXII</td><td>-90.76</td></tr>
<tr><td>Band IX (Note 2)</td><td>-92.76</td></tr>
<tr><td colspan="2">Îor/Ioc</td><td>dB</td><td>9.54</td><td>-9.19</td></tr>
<tr><td rowspan="5">CPICH RSCP, Note 1</td><td>Band I, IV, VI, X, XI, XIX, XXI</td><td rowspan="5">dBm</td><td rowspan="5">-61.21</td><td>-112.95</td></tr>
<tr><td>Band II, V, VII</td><td>-110.95</td></tr>
<tr><td>Band XXV, XXVI</td><td>-109.45 (Note 3)</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV, XX, XXII</td><td>-109.95</td></tr>
<tr><td>Band IX (Note 2)</td><td>-111.95</td></tr>
<tr><td rowspan="5">Io, Note 1</td><td>Band I, IV, VI, X, XI, XIX, XXI</td><td rowspan="5">dBm/3.84 MHz</td><td rowspan="5">-50.75</td><td>-93.27</td></tr>
<tr><td>Band II, V, VII</td><td>-91.27</td></tr>
<tr><td>Band XXV, XXVI</td><td>-89.77 (Note 3)</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV, XX, XXII</td><td>-90.27</td></tr>
<tr><td>Band IX (Note 2)</td><td>-92.27</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td>AWGN</td><td>AWGN</td></tr>
<tr><td colspan="5">NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.</td></tr>
<tr><td colspan="5">Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.</td></tr>
</table>

Each UTRAN FDD CPICH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.3.1.5-3.

Table 9.3.1.5-3: UTRAN FDD CPICH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2				
	All bands	Band I, IV, VI, X, XI, XIX, XXI	Band II, V, VII	Band XXV, XXVI (Note 2)	Band III, VIII, XII, XIII, XIV, XX, XXII	Band IX (Note 1)
Normal Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_46	CPICH_RSCP_-04	CPICH_RSCP_-02	CPICH_RSCP_-01	CPICH_RSCP_-01	CPICH_RSCP_-03
Highest reported value (Cell 2)	CPICH_RSCP_63	CPICH_RSCP_9	CPICH_RSCP_11	CPICH_RSCP_13	CPICH_RSCP_12	CPICH_RSCP_10
Extreme Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_43	CPICH_RSCP_-05	CPICH_RSCP_-05	CPICH_RSCP_-04	CPICH_RSCP_-04	CPICH_RSCP_-05
Highest reported value (Cell 2)	CPICH_RSCP_66	CPICH_RSCP_12	CPICH_RSCP_14	CPICH_RSCP_16	CPICH_RSCP_15	CPICH_RSCP_13
NOTE 1: For a multiband UE supporting both Band III and Band IX, for Band IX apply the test requirements of Band III. (Reference Table 9.3.1.5-2, Note 2). NOTE 2: For a multiband UE supporting both Band V and Band XXVI, for Band XXVI when the carrier frequency of the assigned UTRA channel in is within 869-894 MHz apply the test requirements of Band V. (Reference Table 9.3.1.5-2, Note 3).						

9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy

9.3.2.1 Test purpose

To verify that the E-UTRAN TDD - UTRA FDD CPICH RSCP absolute measurement accuracy is within the specified limits.

9.3.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

9.3.2.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH RSCP.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.3.2.3-1.

Table 9.3.2.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	Io range		
		UTRA operating bands	Minimum Io	Maximum Io
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz
±6	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70
		Band IX	-93	-70
		Band II, V and VII	-92	-70
		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70
		Band XXV, XXVI Note 1	-90.5	-70
±8	±11	Note 2	-70	-50
NOTE 1: For Band XXVI, the condition has the minimum Io of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies. NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.				

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.2.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV_-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV_-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV_89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV_90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV_91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.1.2 and 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.2.

9.3.2.4 Test description

9.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.2.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.3.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.3.2.5-1 and 9.3.2.5-2 for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check CPICH_RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.3.2.5-3 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Set the parameters according to Tables 9.3.2.5-1and 9.3.2.5-2 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.3.2.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.3.2.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.3.2.4.3-3: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-RSCP	According to specific test		
}			
}			

9.3.2.5 Test requirement

The test parameters are given in Tables 9.3.2.4.1-1, 9.3.2.5-1 and 9.3.2.5-2 as below. Table 9.3.2.5-2 and 9.3.2.5-3 define the primary level settings including test tolerances for all tests.

Each UTRAN FDD CPICH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.3.2.5-3.

Table 9.3.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration[Note1]		6	
Uplink-downlink configuration[Note1]		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 2]	dB		
OCNG_RB[Note 2]	dB		
N_{oc} [Note 3]	dBm/15 kHz	-98	
RSRP [Note 4]	dBm/15 kHz	-94	
$\hat{E}_s/I_{ot}$	dB	4	
SCH_RP [Note 4]	dBm/15 kHz	-94	
$\hat{E}_s/N_{oc}$	dB	4	
Propagation Condition		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.3.2.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter		Unit	Test 1	Test 2
			Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12
SCH_Ec/Ior		dB	-12	-12
PICH_Ec/Ior		dB	-15	-15
DPCH_Ec/Ior		dB	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94
Ioc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-60.75	-93.76
	Band II, V, VII			-91.76
	Band XXV, XXVI			-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII			-90.76
	Band IX (Note 2)			-92.76
Îor/Ioc		dB	9.54	-9.19
CPICH RSCP, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm	-61.21	-112.95
	Band II, V, VII			-110.95
	Band XXV, XXVI			-109.45 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII			-109.95
	Band IX (Note 2)			-111.95
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-50.75	-93.27
	Band II, V, VII			-91.27
	Band XXV, XXVI			-89.77 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII			-90.27
	Band IX (Note 2)			-92.27
Propagation condition		-	AWGN	AWGN
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE. NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.				
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.				

Table 9.3.2.5-3: UTRAN FDD CPICH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2				
	All bands	Band I, IV, VI, X, XI, XIX, XXI	Band II, V, VII	Band XXV, XXVI	Band III, VIII, XII, XIII, XIV, XX, XXII	Band IX
Normal Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_46	CPICH_RSCP_-04	CPICH_RSCP_-02	CPICH_RSCP_-01	CPICH_RSCP_-01	CPICH_RSCP_-03
Highest reported value (Cell 2)	CPICH_RSCP_63	CPICH_RSCP_9	CPICH_RSCP_11	CPICH_RSCP_13	CPICH_RSCP_12	CPICH_RSCP_10
Extreme Conditions						
Lowest reported value (Cell 2)	CPICH_RSCP_43	CPICH_RSCP_-05	CPICH_RSCP_-05	CPICH_RSCP_-04	CPICH_RSCP_-04	CPICH_RSCP_-05
Highest reported value (Cell 2)	CPICH_RSCP_66	CPICH_RSCP_12	CPICH_RSCP_14	CPICH_RSCP_16	CPICH_RSCP_15	CPICH_RSCP_13

9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth

9.3.3.1 Test purpose

To verify that the CPICH RSCP absolute measurement accuracy is within the specified limits for Band 31.

9.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support E-UTRA Band 31 and UTRA FDD.

9.3.3.3 Minimum conformance requirements

The requirements in this clause are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in TS 36.133[4] clauses 8.1.2.4.1 and 8.1.2.4.2.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in TS 36.133[4] table 9.3.3.3-1, under the following conditions:

- CPICH Ec/Io condition for a detectable cell is as specified in TS 36.133[4] clauses 8.1.2.4.1, 8.1.2.4.2, 8.1.2.4.7, 8.1.2.4.8;

- SCH_Ec/Io condition for a detectable cell is as specified in TS 36.133[4] clauses 8.1.2.4.1, 8.1.2.4.2, 8.1.2.4.7, 8.1.2.4.8.

Table 9.3.3.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Accuracy		Conditions		
Normal condition	Extreme condition	Io range		
		UTRA operating bands	Minimum Io	Maximum Io
dB	dB		dBm/3.84 MHz	dBm/3.84 MHz
±6	±9	Band I, IV, VI, X XI, XIX and XXI	-94	-70
		Band IX	-93	-70
		Band II, V and VII	-92	-70
		Band III, VIII, XII, XIII, XIV , XX and XXII	-91	-70
		Band XXV, XXVI Note 1	-90.5	-70
±8	±11	Note 2	-70	-50
NOTE 1: For Band XXVI, the condition has the minimum Io of -92 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies. NOTE 2: The same bands apply for this requirement as for the corresponding highest accuracy requirement.				

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the relevant UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133[4] clause 8.1.2.4 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.3.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.3.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV_-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV_-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV_-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV_89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV_90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV_91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clause 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.3.

9.3.3.4 Test description

9.3.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.3.4.3.

5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.3.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 9.3.1.4.1-1 for other general test parameters.			

9.3.3.4.2 Test procedure

Same test procedure as defined in clause 9.3.1.4.2 with the following exceptions:

- Instead of Table 9.3.1.5-1 → use Table 9.3.3.5-1.

9.3.3.4.3 Message contents

Same message contents as defined in clause 9.3.1.4.3.

9.3.3.5 Test requirement

The test parameters are given in Tables 9.3.3.4.1-1, 9.3.3.5-1 and 9.3.1.5-2 as below. Table 9.3.1.5-2 and 9.3.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.3.3.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter		Unit	Test 1	Test 2
E-UTRAN RF Channel Number			1	
$BW_{channel}$		MHz	5	
OCNG Patterns defined in D.1.15 (OP.15 FDD)			OP.15 FDD	
PBCH_RA		dB	0	
PBCH_RB		dB		
PSS_RA		dB		
SSS_RA		dB		
PCFICH_RB		dB		
PHICH_RA		dB		
PHICH_RB		dB		
PDCCH_RA		dB		
PDCCH_RB		dB		
PDSCH_RA		dB		
PDSCH_RB		dB		
OCNG_RA Note 1		dB		
OCNG_RB Note 1		dB		
N_{oc} Note 2	Band 31	dBm/15 kHz	-98	
RSRP Note 3	Band 31	dBm/15 kHz	-94	
$\hat{E}_s/I_{ot}$		dB	4	
SCH_RP Note 3	Band 31	dBm/15 kHz	-94	
$\hat{E}_s/N_{oc}$		dB	4	
Io Note3	Band 31	dBm/4.5 MHz	-67.8	
Propagation Condition			AWGN	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP, SCH_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

9.4 UTRAN FDD CPICH Ec/No

9.4.1 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy

9.4.1.1 Test purpose

To verify that the E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits.

9.4.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

9.4.1.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No

The accuracy requirements in table 9.4.1.3-1 are valid under the following conditions:

CPICH_RSCP$|_{dBm}$ ≥ -114 dBm for Bands I, IV, VI, X, XI, XIX and XXI

CPICH_RSCP$|_{dBm}$ ≥ -113 dBm for Band IX,

CPICH_RSCP$|_{dBm}$ ≥ -112 dBm for Bands II, V and VII,

CPICH_RSCP$|_{dBm}$ ≥ -111 dBm for Band III, VIII, XII, XIII, XIV, XX and XXII

CPICH_RSCP$|_{dBm}$ ≥ -110.5 dBm for Band XXV.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.4.1.3-1: UTRA FDD CPICH_Ec/Io absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions				
		Normal condition	Extreme condition	Band I, IV VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV, XX and XXII	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-90.5…-50 (Note 1)	-91…-50	-93...-50
NOTE 1: The condition is -92…-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.								

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.4.1.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.1.3-2: UTRA FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No_00	CPICH Ec/Io < -24	dB
CPICH_Ec/No_01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No_02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No_47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No_48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No_49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.1 and 9.1.2.3 and TS 36.133 [4] clause 9.2.3 and A.9.4.1.

9.4.1.4 Test description

9.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.4.1.4.3.

4. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.4.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.4.1.5-2 and 9.4.1.5-3 for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit a RRCConnectionReconfiguration message on cell1.

4. The UE shall transmit a RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check UTRA FDD CPICH Ec/Io reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.4.1.5-4 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. If Test 2 not done, set the parameters according to Tables 9.4.1.5-2 and 9.4.1.5-3 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9. If Test 3 not done, set the parameters according to Tables 9.4.1.5-2 and 9.4.1.5-3 for Test 3. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 3.

9.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.4.1.4.3-1: CPICH_Ec/Io measurement configuration

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7

Table 9.4.1.4.3-2: *MeasConfig- DEFAULT:* CPICH_Ec/Io measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.4.1.4.3-3: *MeasResults*: CPICH_Ec/Io measurement configuration

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.4.1.4.3-4: MeasResultListUTRA: CPICH_Ec/Io measurement configuration

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-EcN0	According to specific test		
}			
}			

9.4.1.5 Test requirement

The test parameters are given in Tables 9.4.1.5-1, 9.4.1.5-2 and 9.4.1.5-3 as below. Table, 9.4.1.5-2 and 9.4.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.4.1.5-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133[4] section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table 9.4.1.5-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-94		
$\hat{E}_s/I_{ot}$	dB	4		
SCH_RP Note 3	dBm/15 kHz	-94		
$\hat{E}_s/N_{oc}$	dB	4		
Propagation Condition		AWGN		

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.4.1.5-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter		Unit	Test 1	Test 2	Test 3
			Cell 2	Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12	-12
SCH_Ec/Ior		dB	-12	-12	-12
PICH_Ec/Ior		dB	-15	-15	-15
DPCH_Ec/Ior		dB	-	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94	-0.94
Ioc	Band I, IV, VI, X, XI, XIX, XXI	dBm/ 3.84 MHz	-53.12	-87.27	-93.76
	Band II, V, VII				-91.76
	Band XXV, XXVI				-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII				-90.76
	Band IX (Note 2)				-92.76
Îor/Ioc		dB	-1.45	-4.4	-9.14
CPICH Ec/Io, Note 1		dBm	-13.8	-15.75	-19.64
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/ 3.84 MHz	-50.77	-85.92	-93.26
	Band II, V, VII				-91.26
	Band XXV, XXVI				-89.76 (Note 3)
	Band III, VIII, XII, XIII, XIV, XX, XXII				-90.26
	Band IX (Note 2)				-92.26
Propagation condition		-	AWGN	AWGN	AWGN
NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE. NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not lose the Cell 2 in between the tests.					

Each UTRAN FDD CPICH Ec/No absolute measurement accuracy test shall meet the reported values test requirements in table 9.4.1.5-4.

Table 9.4.1.5-4: UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value	CPICH_Ec/No_17	CPICH_Ec/No_13	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_24	CPICH_Ec/No_22	CPICH_Ec/No_16
Extreme Conditions			
Lowest reported value	CPICH_Ec/No_14	CPICH_Ec/No_11	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_27	CPICH_Ec/No_24	CPICH_Ec/No_16

9.4.2 E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy

9.4.2.1 Test purpose

To verify that the E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits.

9.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

9.4.2.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No.

The accuracy requirements in table 9.4.2.3-1 are valid under the following conditions:

$CPICH\_RSCP|_{dBm} \geq -114$ dBm for Bands I, IV, VI, X, XI, XIX and XXI,

$CPICH\_RSCP|_{dBm} \geq -113$ dBm for Band IX

$CPICH\_RSCP|_{dBm} \geq -112$ dBm for Bands II, V and VII,

$CPICH\_RSCP|_{dBm} \geq -111$ dBm for Band III, VIII, XII, XIII, XIV and XX,

$CPICH\_RSCP|_{dBm} \geq -110.5$ dBm for Band XXV.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.4.2.3-1: UTRAN FDD CPICH_Ec/Io absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions				
		Normal condition	Extreme condition	Band I, IV, VI, X, XI, XIX and XXI	Band II, V and VII	Band XXV and XXVI	Band III, VIII, XII, XIII, XIV, XX and XXII	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-90.5...-50 (Note 1)	-91…-50	-93...-50
NOTE 1: The condition is -92…-50 dBm/3.84 MHz when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.								

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.4.2.3-2 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.2.3-2: UTRAN FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No_00	CPICH Ec/Io < -24	dB
CPICH_Ec/No_01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No_02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No_47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No_48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No_49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.1 and 9.1.2.3 and TS 36.133 [4] clause 9.2.3 and A.9.4.2.

9.4.2.4 Test description

9.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.4.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.4.2.4.1-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbour cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.4.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Tables 9.4.2.5-1 and 9.4.2.5-2 as appropriate for Test 1. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check CPICH_Ec/Io reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.4.2.5-3 as appropriate for Test 1. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. If Test 2 not done, set the parameters according to Tables 9.4.2.5-1 and 9.4.2.5-2 for Test 2. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 2.

9. If Test 3 not done, set the parameters according to Tables 9.4.2.5-1 and 9.4.2.5-2 for Test 3. While RF parameters are being changed any MeasurementReport messages send from the UE shall be ignored by the SS. SS shall wait for an additional 1s and still ignore any MeasurementReport messages send from the UE. Then, step 6 and 7 above are repeated as appropriate for Test 3.

9.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.4.2.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.4.2.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.4.2.4.3-3: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-EcN0	According to specific test		
}			
}			

9.4.2.5 Test requirement

The test parameters are given in Tables 9.4.2.4.1-1, 9.4.2.5-1 and 9.4.2.5-2 as below. Table 9.4.2.5-1 and 9.4.2.5-2 define the primary level settings including test tolerances for all tests.

Each UTRAN FDD CPICH Ec/No absolute measurement accuracy test shall meet the reported values test requirements in table 9.4.2.5-3.

Table 9.4.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration[Note1]		6		
Uplink-downlink configuration[Note1]		1		
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note 2]	dB			
OCNG_RB[Note 2]	dB			
N_{oc} [Note 3]	dBm/15 kHz	-98		
RSRP [Note 4]	dBm/15 kHz	-94		
$\hat{E}_s/I_{ot}$	dB	4		
SCH_RP [Note 4]	dBm/15 kHz	-94		
$\hat{E}_s/N_{oc}$	dB	4		
Propagation Condition		AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.4.2.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter		Unit	Test 1	Test 2	Test 3
			Cell 2	Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12	-12
SCH_Ec/Ior		dB	-12	-12	-12
PICH_Ec/Ior		dB	-15	-15	-15
DPCH_Ec/Ior		dB	-	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94	-0.94
Ioc	Band I, IV, VI, X, XIX	dBm/ 3.84 MHz	-53.12	-87.27	-93.76
	Band II, V, VII, XI				-91.76
	Band XXV, XXVI				-90.26 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII				-90.76
	Band IX (Note 2)				-92.76
Îor/Ioc		dB	-1.45	-4.4	-9.14
CPICH Ec/Io, Note 1		dBm	-13.8	-15.75	-19.64
Io, Note 1	Band I, IV, VI, X, XIX	dBm/ 3.84 MHz	-50.77	-85.92	-93.26
	Band II, V, VII, XI				-91.26
	Band XXV, XXVI				-89.76 (Note 3)
	Band III, VIII, XII, XIII, XIV, XXII				-90.26
	Band IX (Note 2)				-92.26
Propagation condition		-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
NOTE 3: The test parameter is modified by -1.5 dB when the carrier frequency of the assigned UTRA channel is within 869-894 MHz for the UE which supports both Band V and Band XXVI operating frequencies.
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

Table 9.4.2.5-3: UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value	CPICH_Ec/No_17	CPICH_Ec/No_13	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_24	CPICH_Ec/No_22	CPICH_Ec/No_16
Extreme Conditions			
Lowest reported value	CPICH_Ec/No_14	CPICH_Ec/No_11	CPICH_Ec/No_0
Highest reported value	CPICH_Ec/No_27	CPICH_Ec/No_24	CPICH_Ec/No_16

9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth

9.4.3.1 Test purpose

To verify that the E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits for Band 31.

9.4.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support E-UTRA Band 31 and UTRA FDD.

9.4.3.3 Minimum conformance requirements

The measurement period for RRC_CONNECTED state is specified in TS 36.133[4] clauses 8.1.2.4.1 and 8.1.2.4.2.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No in TS 25.133 [18].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133[4] clause 8.1.2.4.1 shall apply.

The reporting range is for *CPICH Ec/Io* is from -24 ...0 dB.

In table 9.4.3.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.3.3-2: UTRA FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No_00	CPICH Ec/Io < -24	dB
CPICH_Ec/No_01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No_02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No_47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No_48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No_49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.1 and 9.1.2.3 and TS 36.133 [4] clause 9.2.3 and A.9.4.3.

9.4.3.4 Test description

9.4.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.4.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.4.3.4.3.

5. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.4.3.4.1-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.5 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.11 FDD	As specified in clause A.2.1
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	5	
Note 1: See Table 9.4.1.5-1 for other general test parameters.			

9.4.3.4.2 Test procedure

Same test procedure as defined in clause 9.4.1.4.2 with the following exceptions:

- Instead of Table 9.4.1.5-2 → use Table 9.4.3.5-1.

9.4.3.4.3 Message contents

Same message contents as defined in clause 9.4.1.4.3.

9.4.3.5 Test requirement

The test parameters are given in Tables 9.4.1.4.1-1, 9.4.3.5-1 and 9.4.1.5-3. Tables 9.4.3.5-1 and 9.4.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.4.1.5-4 defines the UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values.

Table 9.4.3.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD for 5MHz bandwidth

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Test 1</th><th>Test 2</th><th>Test 3</th></tr>
<tr><td colspan="2">E-UTRAN RF Channel Number</td><td></td><td colspan="3">1</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td>MHz</td><td colspan="3">5</td></tr>
<tr><td colspan="2">OCNG Patterns defined in A.3.2.1.15 (OP.15 FDD)</td><td></td><td colspan="3">OP.15 FDD</td></tr>
<tr><td colspan="2">PBCH_RA</td><td>dB</td><td colspan="3" rowspan="13">0</td></tr>
<tr><td colspan="2">PBCH_RB</td><td>dB</td></tr>
<tr><td colspan="2">PSS_RA</td><td>dB</td></tr>
<tr><td colspan="2">SSS_RA</td><td>dB</td></tr>
<tr><td colspan="2">PCFICH_RB</td><td>dB</td></tr>
<tr><td colspan="2">PHICH_RA</td><td>dB</td></tr>
<tr><td colspan="2">PHICH_RB</td><td>dB</td></tr>
<tr><td colspan="2">PDCCH_RA</td><td>dB</td></tr>
<tr><td colspan="2">PDCCH_RB</td><td>dB</td></tr>
<tr><td colspan="2">PDSCH_RA</td><td>dB</td></tr>
<tr><td colspan="2">PDSCH_RB</td><td>dB</td></tr>
<tr><td colspan="2">OCNG_RA Note 1</td><td>dB</td></tr>
<tr><td colspan="2">OCNG_RB Note 1</td><td>dB</td></tr>
<tr><td>N_{oc} Note 2</td><td>Band 31</td><td>dBm/15 kHz</td><td colspan="3">-98</td></tr>
<tr><td>RSRP Note 3</td><td>Band 31</td><td>dBm/15 kHz</td><td colspan="3">-94</td></tr>
<tr><td colspan="2">$\hat{E}_s / I_{ot}$</td><td>dB</td><td colspan="3">4</td></tr>
<tr><td>SCH_RP Note 3</td><td>Band 31</td><td>dBm/15 kHz</td><td colspan="3">-94</td></tr>
<tr><td colspan="2">$\hat{E}_s / N_{oc}$</td><td>dB</td><td colspan="3">4</td></tr>
<tr><td>Io Note3</td><td>Band 31</td><td>dBm/4.5 MHz</td><td colspan="3">-67.8</td></tr>
<tr><td colspan="2">Propagation Condition</td><td></td><td colspan="3">AWGN</td></tr>
<tr><td colspan="6">Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</td></tr>
</table>

9.5 UTRAN TDD P-CCPCH RSCP

9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy

9.5.1.1 Test purpose

To verify that the UTRAN TDD P-CCPCH RSCP absolute measurement accuracy is within the specified limits.

9.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bit 39.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 22.

9.5.1.3 Minimum conformance requirements

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for URAN TDD P-CCPCH RSCP in 3GPP TS 25.123 [22].

The accuracy requirements in table 9.5.1.3-1 are valid under the following conditions:

P-CCPCH RSCP ≥ -102 dBm

P-CCPCH Ec/Io ≥ -8 dB

DwPCH_Ec/Io ≥ -5 dB

Table 9.5.1.3-1: UTRAN TDD P-CCPCH absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/ 1.28 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the UTRAN TDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.3 shall apply.

The reporting range is for URAN TDD P-CCPCH RSCP is from -115 …-25 dBm.

In table 9.5.1.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.5.1.3-2: UTRAN TDD P-CCPCH absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
P-CCPCH RSCP_LEV_-05	P-CCPCH RSCP <-120	dBm
P-CCPCH RSCP_LEV_-04	-120 ≤ P-CCPCH RSCP < -119	dBm
P-CCPCH RSCP_LEV_-03	-119 ≤ P-CCPCH RSCP < -118	dBm
…	…	…
PCCPCH_RSCP_LEV_89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV_90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV_91	-25 ≤ PCCPCH RSCP	dBm

The normative reference for this requirement is TS 25.123 [22] clause 9.1.1.1.1.2, clause 9.1.1.1.3 and TS 36.133 [4] clause 9.3.1 and A.9.5.1.

9.5.1.4 Test description

9.5.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.5.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.5.1.4.3.

5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.5.1.4.1-1: General test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRA FDD cell1 on RF channel number 1
Neighbour cell		Cell 2	1.28Mcps UTRA TDD Cell2 on RF channel number 2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSCP	

9.5.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.5.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check P-CCPCH RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.5.1.5-3. If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.5.1.5-1 as appropriate.

9.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.5.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 9.5.1.4.3-2: *MeasConfig- DEFAULT:* Additional E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig SEQUENCE {			
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-TDD	pccpch-RSCP		
}			
}			
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.5.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.5.1.4.3-4: MeasResultListUTRA: Additional E-UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	Not Present		
tdd	PhysCellIdUTRA-TDD		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

9.5.1.5 Test requirement

The test parameters are given in Tables 9.5.1.4.1-1, 9.5.1.5-1 and 9.5.1.5-2 as below. Table 9.5.1.5-2 and 9.5.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.5.1.5-1: E-UTRAN FDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1		
BWchannel	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	dBm/15 kHz	-98		
$\hat{E}_s / I_{ot}$	dB	4		
RSRP Note3	dBm/15 kHz	-94		
Io Note3	dBm/9 MHz	-64.76		
$\hat{E}_s / N_{oc}$	dB	4		
Propagation condition	-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.				

Table 9.5.1.5-2: UTRAN TDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1		Test 2		Test 3	
DL timeslot number		0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF Channel number Note2		Channel 2		Channel 2		Channel 2	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
DwPCH_Ec/Ior	dB		0		0		0
OCNS_Ec/Ior	dB	-3		-3		-3	
Ioc	dBm/1.28MHz	-54.9		-75.2		-96.8	
Îor/Ioc	dB	2		5		0	
PCCPCH RSCP Note1	dBm	-55.9		-73.2		-99.2	
Io Note1	dBm/1.28MHz	-50.78		-69.01		-93.19	
Propagation condition		AWGN					
Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.							

Each UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.5.1.5-3.

Table 9.5.1.5-3: UTRAN TDD P-CCPCH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_51	P-CCPCH RSCP_LEV 34	P-CCPCH RSCP_LEV 10
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_68	P-CCPCH RSCP_LEV 51	P-CCPCH RSCP_LEV 23
Extreme Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_48	P-CCPCH RSCP_LEV 31	P-CCPCH RSCP_LEV 07
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_71	P-CCPCH RSCP_LEV 54	P-CCPCH RSCP_LEV 26

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy

9.5.2.1 Test purpose

To verify that the UTRAN TDD P-CCPCH RSCP absolute measurement accuracy is within the specified limits.

9.5.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD. Applicability requires support for FGI bit 39.

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA TDD and not supporting UTRA FDD. Applicability requires support for FGI bit 22.

9.5.2.3 Minimum conformance requirements

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for URAN TDD P-CCPCH RSCP in 3GPP TS 25.123 [22].

The accuracy requirements in table 9.5.2.3-1 are valid under the following conditions:

P-CCPCH RSCP ≥ -102 dBm

P-CCPCH Ec/Io ≥ -8 dB

DwPCH_Ec/Io ≥ -5 dB

Table 9.5.2.3-1: UTRAN TDD P-CCPCH absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/ 1.28 MHz]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the UTRAN TDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.3 shall apply.

The reporting range is for URAN TDD P-CCPCH RSCP is from -115 …-25 dBm.

In table 9.5.2.3-2 the mapping of measured quantity is defined.

The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.5.2.3-2: UTRAN TDD P-CCPCH absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
PCCPCH_RSCP_LEV -05	P-CCPCH RSCP <-120	dBm
PCCPCH_RSCP_LEV -04	-120 ≤ P-CCPCH RSCP < -119	dBm
PCCPCH_RSCP_LEV -03	-119 ≤ P-CCPCH RSCP < -118	dBm
…	…	…
PCCPCH_RSCP_LEV_89	-27 ≤ PCCPCH RSCP< -26	dBm
PCCPCH_RSCP_LEV_90	-26 ≤ PCCPCH RSCP< -25	dBm
PCCPCH_RSCP_LEV_91	-25 ≤ PCCPCH RSCP	dBm

The normative reference for this requirement is TS 25.123 [22] clause 9.1.1.1.1.2, clause 9.1.1.1.3 and TS 36.133 [4] clause 9.3.1 and A.9.5.2.

9.5.2.4 Test description

9.5.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.22.

2. The general test parameter settings are set up according to Table 9.5.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.5.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN TDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.5.2.4.1-1: General test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRA TDD cell1 on RF channel number 1
Neighbour cell		Cell 2	1.28Mcps UTRA TDD Cell2 on RF channel number 2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSCP	

9.5.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.5.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check P-CCPCH RSCP reported values of Cell 2 in periodical MeasurementReport messages according to Table 9.5.2.5-3 If the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one..

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.5.2.5-1 as appropriate.

9.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.5.2.4.3-1: Common Exception messages for E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 9.5.2.4.3-2: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig SEQUENCE {			
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-TDD	pccpch-RSCP		
}			
}			
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.5.2.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.5.2.4.3-4: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	Not Present		
tdd	PhysCellIdUTRA-TDD		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

9.5.2.5 Test requirement

The test parameters are given in Tables 9.5.2.4.1-1, 9.5.2.5-1 and 9.5.2.5-2 as below. Table 9.5.2.5-2 and 9.5.2.5-3 define the primary level settings including test tolerances for all tests.

Table 9.5.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1		
BWchannel	MHz	10		
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD		
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA Note1				
OCNG_RB Note1				
N_{oc} Note2	dBm/15 kHz	-98		
$\hat{E}_s / I_{ot}$	dB	4		
RSRP Note3	dBm/15 kHz	-94		
Io Note3	dBm/9 MHz	-64.76		
$\hat{E}_s / N_{oc}$	dB	4		
Propagation condition	-	AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.				

Table 9.5.2.5-2: UTRAN TDD cell specific test parameters for UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1		Test 2		Test 3	
DL timeslot number		0	DwPTS	0	DwPTS	0	DwPTS
UTRA RF Channel number Note2		Channel 2		Channel 2		Channel 2	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
DwPCH_Ec/Ior	dB		0		0		0
OCNS_Ec/Ior	dB	-3		-3		-3	
Ioc	dBm/1.28MHz	-54.9		-75.2		-96.2	
Îor/Ioc	dB	2		5		0	
PCCPCH RSCP Note1	dBm	-55.9		-73.2		-99.2	
Io Note1	dBm/1.28MHz	-50.78		-69.01		-93.19	
Propagation condition		AWGN					
Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.							

Each UTRAN TDD P-CCPCH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.5.2.5-3.

Table 9.5.2.5-3: UTRAN TDD P-CCPCH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_51	P-CCPCH RSCP_LEV 34	P-CCPCH RSCP_LEV 10
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_68	P-CCPCH RSCP_LEV 51	P-CCPCH RSCP_LEV 23
Extreme Conditions			
Lowest reported value (Cell 2)	P-CCPCH RSCP_LEV_48	P-CCPCH RSCP_LEV 31	P-CCPCH RSCP_LEV 07
Highest reported value (Cell 2)	P-CCPCH RSCP_LEV_71	P-CCPCH RSCP_LEV 54	P-CCPCH RSCP_LEV 26

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.6 GSM carrier RSSI

9.6.1 GSM RSSI accuracy for E-UTRAN FDD

9.6.1.1 Test purpose

To verify that the GSM RSSI measurement accuracy is within the specified limits.

9.6.1.2 Test applicability

This test applies all the types of E-UTRA FDD UE release 9 and forward that support GSM. Applicability requires support for FGI bits 16 and 23.

9.6.1.3 Minimum conformance requirements

Absolute accuracy

The R.M.S received signal level at the receiver input shall be measured by the MS and the BSS over the full range of -110 dBm to -48 dBm with an absolute accuracy of ±4 dB from -110 dBm to -70 dBm under normal conditions and ±6 dB over the full range under both normal and extreme conditions. The R.M.S received signal level at the receiver input shall be measured by the MS above -48 dBm up to -38 dBm with an absolute accuracy of ± 9 dB under both normal and extreme conditions.

This requirement is summarized in Table 9.6.1.3-1.

Table 9.6.1.3-1: GSM RXLEV absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Input level dBm
RXLEV	dBm	± 4	± 6	-110…-70
	dBm	± 6	± 6	-70…-48
	dBm	± 9	± 9	-48..-38

The reporting range and mapping for RXLEV is summarized in Table 9.6.1.3-2.

Table 9.6.1.3-2: GSM RSSI measurement report mapping

Reported value	Measured quantity value	Unit
RXLEV_00	RXLEV < -110	dBm
RXLEV_01	-110 ≤ RXLEV < -109	dBm
RXLEV_02	-109 ≤ RXLEV < -108	dBm
…	…	…
RXLEV_61	-50≤ RXLEV < -49	dBm
RXLEV_62	-49 ≤ RXLEV < -48	dBm
RXLEV_63	-48 ≤ RXLEV	dBm

Relative accuracy

The relative accuracy shall be as follows:

If signals of level x1 and x2 dBm are received (where x1 ≤ x2) and levels y1 and y2 dBm respectively are measured, if x2 - x1 < 20 dB and x1 is not below the reference sensitivity level, then y1 and y2 shall be such that:

(x2 - x1) - a ≤ y2 - y1 ≤ (x2 - x1 + b) if the measurements are on the same or on different RF channel within the same frequency band;

and

(x2 - x1) - c ≤ y2 - y1 ≤(x2 - x1 + d) if the measurements are on different frequency bands:

a, b, c and d are in dB and depend on the value of x1 as follows:

	a	b	c	d
x1 ≥ s+14, x2< -48 dBm	2	2	4	4
s+14 > x1 ≥ s+1	3	2	5	4
s+1 > x1	4	2	6	4

For single band MS and measurements between ARFCN in the same band for a multiband MS:

s = reference sensitivity level as specified in Table 9.6.1.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a)

For measurements between ARFCN in different bands:

s = the reference sensitivity level as specified in Table 9.6.1.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a) for the band including x1.

Table 9.6.1.3-3: Reference sensitivity level for MS

GSM 400 MS	for GSM 400 small MS	-102 dBm
	for other GSM 400 MS	-104 dBm
GSM 900 MS	for GSM 900 small MS	-102 dBm
	for other GSM 900 MS	-104 dBm
GSM 850 MS	for GSM 850 small MS	-102 dBm
	for other GSM 850 MS	-104 dBm
GSM 700 MS	for GSM 700 small MS	-102 dBm
	for other GSM 700 MS	-104 dBm
DCS 1 800 MS	for DCS 1 800 class 1 or class 2 MS	-100 / -102 dBm *
	for DCS 1 800 class 3 MS	-102 dBm
PCS 1 900 MS	for PCS 1 900 class 1 or class 2 MS	-102 dBm
	for other PCS 1 900 MS	-104 dBm
Note:	For DCS 1 800 class 1 and class 2 MS, the 102 dBm level shall apply for the reference sensitivity performance as specified in table 1 for the normal conditions defined in TS 45.005 [16] Annex D and 100 dBm level shall be used to determine all other MS performances.	

The normative reference for this requirement is:

For E-UTRA: TS 36.133 [4] clause 9.4.1 and A.9.6.1

For GSM: TS 45.008 [15] clause 8.1.2 and 8.1.4 and TS 45.005 [16].

9.6.1.4 Test description

9.6.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 9.6.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.6.1.4.3.

5. There is one E-UTRA FDD cell (Cell 1) and two GSM cells (Cell 2 and Cell 3) specified in each test. Cell 1 is the cell used for call setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (BCCH1) and Cell 3 (BCCH other than BCCH1 according to sub-test) are measured and reported by the UE.

Table 9.6.1.4.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Active cell	-	Cell 1	
DRX	-	OFF	
Gap pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

9.6.1.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.6.1.5-1, 9.6 1.5-2 and 9.6 1.5-3 as appropriate. Propagation conditions for the E-UTRA cell are set according to Annex B clause B.1. For sub-test 4 and sub-test 12 GERAN cell is initialized to -95dBm.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. Only for sub-tests 4 and 12, SS waits for 10s for initial measurement report by UE and ignores measurement reports received at this stage. If SS receives the measurement reports, then adjust the power levels of Cell 2 according to Table

9.6.1.5-2. SS ignores measurement reports for 1 reportInterval cycle (1024ms) and continues with step 7, else fail the UE for the relevant subtest and skip to Step.9

7. SS shall check the reported GSM RSSI values in periodical MeasurementReport messages. The reported RSSI value for Cell 2 is compared to the actual RSSI value according to Table 9.6.1.5-4. This counts as a Pass or Fail for the event "Absolute". Also the reported RSSI value for Cell 3 is compared to the reported RSSI value for Cell 2 for each MeasurementReport message according to Table 9.6.1.5-5. This counts as a Pass or Fail for the event "Relative".
If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the event "Absolute" is increased by one.
If the UE fails to report the measurement value for any of Cell 2 or Cell 3, the number of failed iterations for the event "Relative" is increased by one.

8. The SS shall check the periodical MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved for each of the events "Absolute" and "Relative". Each event is evaluated only until the confidence level is achieved. Different events may require different times for a verdict.

9. Repeat step 1-9 for each sub-test in Table 9.6.1.5-2 as appropriate.

9.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.6.1.4.3-1: Common Exception messages for GSM RSSI measurement accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-11

Table 9.6.1.4.3-2: MeasuredResults: Additional GSM RSSI measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultListGERAN	MeasResultListGERAN		
}			
}			

Table 9.6.1.4.3-3: MeasResultListGERAN: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
Cgi-Info	Not present		
measResult SEQUENCE {			
Rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

Table 9.6.1.4.3-4: ReportConfigInterRAT-PERIODICAL: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-9 ReportConfigInterRAT-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-PERIODICAL ::= SEQUENCE {			
maxReportCells	6		
}			

9.6.1.5 Test requirement

Tables 9.6.1.5-1, 9.6.1.5-2 and 9.6.1.5-3 define the primary level settings including test tolerances for all tests.

The GSM RSSI measurement accuracy test for the reported values shall meet the requirements in Table 9.6.1.5-4 and Table 9.6.1.5-5.

Table 9.6.1.5-1: E-UTRAN FDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN FDD

Parameter	Unit	Tests 1-12
E-UTRAN RF Channel Number		1
$BW_{channel}$	MHz	10
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD

PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{E}_s/I_{ot}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
$\hat{E}_s/N_{oc}$	dB	4
Propagation Condition		AWGN
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 9.6.1.5-2: BCCH signal levels at receiver input in dBm

Sub-test	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
1	-38.7	-38.5	NA	NA	NA	NA
2	-48.7	-50.0	NA	NA	NA	NA
3	-70.7	-70.5	NA	NA	NA	NA
4	-109.3	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

Table 9.6.1.5-3: ARFCN numbers for GSM cells

GSM band	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
GSM 450	276	293	264	269	281	288
GSM 480	323	340	311	316	328	335
GSM 750	475	511	440	455	485	500
GSM 850	189	251	150	170	210	230
GSM 900	62	124	20	40	80	100
DCS 1800	700	885	585	660	790	835
PCS 1900	700	805	585	660	790	550
Note: As defined in clause 3A.1, the test shall run without frequency overlapping between E-UTRA and GSM cells. The ARFCN numbers defined here, can be updated accordingly (even E-UTRA band specific) to avoid possible overlapping.						

Table 9.6.1.5-4: GSM Carrier RSSI absolute accuracy requirements for the reported values

Sub-test	Normal Condition		Extreme condition	
	Lowest reported value for BCCH1	Highest reported value for BCCH1	Lowest reported value for BCCH1	Highest reported value for BCCH1
1	RXLEV_62	RXLEV_63	RXLEV_62	RXLEV_63
2	RXLEV_55	RXLEV_63	RXLEV_55	RXLEV_63
3	RXLEV_35	RXLEV_45	RXLEV_33	RXLEV_47
4	RXLEV_00	RXLEV_06	RXLEV_00	RXLEV_08
5	RXLEV_46	RXLEV_60	RXLEV_46	RXLEV_60
6	RXLEV_39	RXLEV_53	RXLEV_39	RXLEV_53
7	RXLEV_34	RXLEV_44	RXLEV_32	RXLEV_46
8	RXLEV_27	RXLEV_37	RXLEV_25	RXLEV_39
9	RXLEV_20	RXLEV_30	RXLEV_18	RXLEV_32
10	RXLEV_13	RXLEV_23	RXLEV_11	RXLEV_25
11	RXLEV_06	RXLEV_16	RXLEV_04	RXLEV_18
12	RXLEV_00	RXLEV_09	RXLEV_00	RXLEV_11
Note: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the absolute accuracy for sub-test 12 is not tested.				

Table 9.6.1.5-5: GSM Carrier RSSI Relative accuracy requirements for the reported values

Sub-test	Normal & Extreme condition	
	Lowest reported value for BCCH2	Highest reported value for BCCH2
1	N/A (Note3)	N/A(Note3)
2	RXLEV = x-6	RXLEV = x+3
3	RXLEV = x-4	RXLEV = x+5
4	N/A (Note3)	N/A (Note3)
	Lowest reported value for BCCH3	Highest reported value for BCCH3
5	RXLEV = x-2	RXLEV = x+8
6	RXLEV = x+1	RXLEV = x+10
	Lowest reported value for BCCH4	Highest reported value for BCCH4
7	RXLEV = x+3	RXLEV = x+12
8	RXLEV = x+5	RXLEV = x+14
	Lowest reported value for BCCH5	Highest reported value for BCCH5
9	RXLEV = x+7	RXLEV = x+16
10	RXLEV = x+8	RXLEV = x+18
	Lowest reported value for BCCH6	Highest reported value for BCCH6
11	RXLEV = x+10	RXLEV = x+20
12	N/A (Note3)	N/A (Note3)
Note 1: x is the reported value RXLEV for BCCH1. Note 2: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the relative accuracy for sub-test 12 is not tested. Note 3: Sub-tests 1, 4 and 12 are not applicable for relative accuracy as they would be testing the UE outside the side conditions.		

For the test to pass, the ratio of successful reported values in each sub-test for absolute and relative accuracy shall be more than 90% with a confidence level of 95%.

9.6.2 GSM RSSI accuracy for E-UTRAN TDD

9.6.2.1 Test purpose

To verify that the GSM RSSI measurement accuracy is within the specified limits.

9.6.2.2 Test applicability

This test applies all the types of E-UTRA TDD UE release 9 and forward that support GSM. Applicability requires support for FGI bit 16 and 23.

9.6.2.3 Minimum conformance requirements

Absolute accuracy

The R.M.S received signal level at the receiver input shall be measured by the MS and the BSS over the full range of -110 dBm to -48 dBm with an absolute accuracy of ±4 dB from -110 dBm to -70 dBm under normal conditions and ±6 dB over the full range under both normal and extreme conditions. The R.M.S received signal level at the receiver input shall be measured by the MS above -48 dBm up to -38 dBm with an absolute accuracy of ± 9 dB under both normal and extreme conditions.

This requirement is summarized in Table 9.6.2.3-1.

Table 9.6.2.3-1: GSM RXLEV absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Input level dBm
RXLEV	dBm	± 4	± 6	-110…-70
	dBm	± 6	± 6	-70…-48
	dBm	± 9	± 9	-48..-38

The reporting range and mapping for RXLEV is summarized in Table 9.6.2.3-2.

Table 9.6.2.3-2: GSM RSSI measurement report mapping

Reported value	Measured quantity value	Unit
RXLEV_00	RXLEV < -110	dBm
RXLEV_01	-110 ≤ RXLEV < -109	dBm
RXLEV_02	-109 ≤ RXLEV < -108	dBm
…	…	…
RXLEV_61	-50 ≤ RXLEV < -49	dBm
RXLEV_62	-49 ≤ RXLEV < -48	dBm
RXLEV_63	-48 ≤ RXLEV	dBm

Relative accuracy

The relative accuracy shall be as follows:

If signals of level x1 and x2 dBm are received (where x1 ≤ x2) and levels y1 and y2 dBm respectively are measured, if x2 - x1 < 20 dB and x1 is not below the reference sensitivity level, then y1 and y2 shall be such that:

(x2 - x1) - a ≤ y2 - y1 ≤ (x2 - x1 + b) if the measurements are on the same or on different RF channel within the same frequency band;

and

(x2 - x1) - c ≤ y2 - y1 ≤(x2 - x1 + d) if the measurements are on different frequency bands:

a, b, c and d are in dB and depend on the value of x1 as follows:

	a	b	c	d
x1 ≥ s+14, x2< -48 dBm	2	2	4	4
s+14 > x1 ≥ s+1	3	2	5	4
s+1 > x1	4	2	6	4

For single band MS and measurements between ARFCN in the same band for a multiband MS:

s = reference sensitivity level as specified in Table 9.6.2.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a)

For measurements between ARFCN in different bands:

s = the reference sensitivity level as specified in Table 9.6.2.3-3 (normative reference 3GPP TS 45.005 [16] Table 6.2-1a) for the band including x1.

Table 9.6.2.3-3: Reference sensitivity level for MS

GSM 400 MS	for GSM 400 small MS	-102 dBm
	for other GSM 400 MS	-104 dBm
GSM 900 MS	for GSM 900 small MS	-102 dBm
	for other GSM 900 MS	-104 dBm
GSM 850 MS	for GSM 850 small MS	-102 dBm
	for other GSM 850 MS	-104 dBm
GSM 700 MS	for GSM 700 small MS	-102 dBm
	for other GSM 700 MS	-104 dBm
DCS 1 800 MS	for DCS 1 800 class 1 or class 2 MS	-100 / -102 dBm *
	for DCS 1 800 class 3 MS	-102 dBm
PCS 1 900 MS	for PCS 1 900 class 1 or class 2 MS	-102 dBm
	for other PCS 1 900 MS	-104 dBm
Note: For DCS 1 800 class 1 and class 2 MS, the 102 dBm level shall apply for the reference sensitivity performance as specified in table 1 for the normal conditions defined in TS 45.005 [16] Annex D and 100 dBm level shall be used to determine all other MS performances.		

The normative reference for this requirement is:

For E-UTRA: TS 36.133 [4] clause 9.4.1 and A.9.6.2

For GSM: TS 45.008 [15] clause 8.1.2 and 8.1.4 and TS 45.005 [16].

9.6.2.4 Test description

9.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 9.6.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.6.2.4.3.

5. There is one E-UTRA TDD cell (Cell 1) and two GSM cells (Cell 2 and Cell 3) specified in each test. Cell 1 is the cell used for call setup with the power level set according to Annexes C.0 and C.1 for this test. Cell 2 (BCCH1) and Cell 3 (BCCH other than BCCH1 according to sub-test) are measured and reported by the UE.

Table 9.6.2.4.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Active cell	-	Cell 1	
DRX	-	OFF	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211 [9]
Gap pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

9.6.2.4.2 Test procedure

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.6.2.5-1, 9.6 2.5-2 and 9.6 2.5-3 as appropriate. Propagation conditions for the E-UTRA cell are set according to Annex B clause B.1. For sub-test 4 and sub-test 12 GERAN cell is initialized to -95dBm.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. Only for sub-tests 4 and 12, SS waits for 10s for initial measurement report by UE and ignores measurement reports received at this stage. If SS receives the measurement reports, then adjust the power levels of Cell 2 according to Table 9.6.2.5-2. SS ignores measurement reports for 1 reportInterval cycle (1024ms) and continues with step 7, else fails the UE for the relevant sub-test and skip to Step.9.

7. SS shall check the reported GSM RSSI value in periodical MeasurementReport messages. The reported RSSI value for Cell 2 is compared to the actual RSSI value according to Table 9.6.2.5-4. This counts as a Pass or Fail for the event “Absolute”. Also the reported RSSI value for Cell 3 is compared to the reported RSSI value for Cell 2 for each MeasurementReport message according to Table 9.6.2.5-5. This counts as a Pass or Fail for the event “Relative”.
If the UE fails to report the measurement value for Cell 2, the number of failed iterations for the event “Absolute” is increased by one.
If the UE fails to report the measurement value for any of Cell 2 or Cell 3, the number of failed iterations for the event ”Relative” is increased by one.

8. The SS shall check the periodical MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G.2 is achieved for each of the events "Absolute” and “Relative”. Each event is evaluated only until the confidence level is achieved. Different events may require different times for a verdict.

9. Repeat step 1-9 for each sub-test in Table 9.6.2.5-2 as appropriate.

9.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.6.2.4.3-1: Common Exception messages for GSM RSSI measurement accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-11

Table 9.6.2.4.3-2: MeasuredResults: Additional GSM RSSI measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultListGERAN	MeasResultListGERAN		
}			
}			

Table 9.6.2.4.3-3: MeasResultListGERAN: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
Cgi-Info	Not present		
measResult SEQUENCE {			
Rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

Table 9.6.2.4.3-4: ReportConfigInterRAT-PERIODICAL: Additional GSM measurement accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-9 ReportConfigInterRAT-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-PERIODICAL ::= SEQUENCE {			
maxReportCells	6		
}			

9.6.2.5 Test requirement

Tables 9.6.2.5-1, 9.6.2.5-2 and 9.6.2.5-3 define the primary level settings including test tolerances for all tests.

The GSM RSSI measurement accuracy test for the reported values shall meet the requirements in Table 9.6.2.5-4 and Table 9.6.2.5-5.

Table 9.6.2.5-1: E-UTRAN TDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN TDD

Parameter	Unit	Tests 1 - 12
E-UTRAN RF Channel Number		1
$BW_{channel}$	MHz	10
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD
PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{E}_s/I_{ot}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
$\hat{E}_s/N_{oc}$	dB	4
Propagation Condition		AWGN
NOTE 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. NOTE 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 9.6.2.5-2: BCCH signal levels at receiver input in dBm

Sub-test	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
1	-38.7	-38.5	NA	NA	NA	NA
2	-48.7	-50.0	NA	NA	NA	NA
3	-70.7	-70.5	NA	NA	NA	NA
4	-109.3	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

Table 9.6.2.5-3: ARFCN numbers for GSM cells

GSM band	BCCH1	BCCH2	BCCH3	BCCH4	BCCH5	BCCH6
GSM 450	276	293	264	269	281	288
GSM 480	323	340	311	316	328	335
GSM 750	475	511	440	455	485	500
GSM 850	189	251	150	170	210	230
GSM 900	62	124	20	40	80	100
DCS 1800	700	885	585	660	790	835
PCS 1900	700	805	585	660	790	550
Note: As defined in clause 3A.1, the test shall run without frequency overlapping between E-UTRA and GSM cells. The ARFCN numbers defined here, can be updated accordingly (even E-UTRA band specific) to avoid possible overlapping.						

Table 9.6.2.5-4: GSM Carrier RSSI absolute accuracy requirements for the reported values

Sub-test	Normal condition		Extreme condition	
	Lowest reported value for BCCH1	Highest reported value for BCCH1	Lowest reported value for BCCH1	Highest reported value for BCCH1
1	RXLEV_62	RXLEV_63	RXLEV_62	RXLEV_63
2	RXLEV_55	RXLEV_63	RXLEV_55	RXLEV_63
3	RXLEV_35	RXLEV_45	RXLEV_33	RXLEV_47
4	RXLEV_00	RXLEV_06	RXLEV_00	RXLEV_08
5	RXLEV_46	RXLEV_60	RXLEV_46	RXLEV_60
6	RXLEV_39	RXLEV_53	RXLEV_39	RXLEV_53
7	RXLEV_34	RXLEV_44	RXLEV_32	RXLEV_46
8	RXLEV_27	RXLEV_37	RXLEV_25	RXLEV_39
9	RXLEV_20	RXLEV_30	RXLEV_18	RXLEV_32
10	RXLEV_13	RXLEV_23	RXLEV_11	RXLEV_25
11	RXLEV_06	RXLEV_16	RXLEV_04	RXLEV_18
12	RXLEV_00	RXLEV_09	RXLEV_00	RXLEV_11
Note: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the absolute accuracy for sub-test 12 is not tested.				

Table 9.6.2.5-5: GSM Carrier RSSI Relative accuracy requirements for the reported values

Sub-test	Normal & Extreme condition	
	Lowest reported value for BCCH2	Highest reported value for BCCH2
1	N/A (Note3)	N/A (Note3)
2	RXLEV = x-6	RXLEV = x+3
3	RXLEV = x-4	RXLEV = x+5
4	N/A (Note3)	N/A (Note3)
	Lowest reported value for BCCH3	Highest reported value for BCCH3
5	RXLEV = x-2	RXLEV = x+8
6	RXLEV = x+1	RXLEV = x+10
	Lowest reported value for BCCH4	Highest reported value for BCCH4
7	RXLEV = x+3	RXLEV = x+12
8	RXLEV = x+5	RXLEV = x+14
	Lowest reported value for BCCH5	Highest reported value for BCCH5
9	RXLEV = x+7	RXLEV = x+16
10	RXLEV = x+8	RXLEV = x+18
	Lowest reported value for BCCH6	Highest reported value for BCCH6
11	RXLEV = x+10	RXLEV = x+20
12	N/A (Note3)	N/A (Note3)
Note 1: x is the reported value RXLEV for BCCH1. Note 2: It is not mandatory for the UE to report BCCH1 in sub-test 12. In case of no BCCH1 report in sub-test 12, the relative accuracy for sub-test 12 is not tested. Note 3: Sub-tests 1, 4 and 12 are not applicable for relative accuracy as they would be testing the UE outside the side conditions.		

For the test to pass, the ratio of successful reported values in each sub-test for absolute and relative accuracy shall be more than 90% with a confidence level of 95%.

9.7 UE Rx – Tx Time Difference

The UE Rx – Tx Time difference test cases can be found in TS 37.571-1 [27].

9.8 RSTD

The RSTD test cases can be found in TS 37.571-1 [27].

9.9 Serving Cell RSRP and RSRQ

9.9.1 FDD Serving Cell RSRP and RSRQ Accuracy

9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy

9.9.1.1.1 Test purpose

To verify the FDD intra-frequency serving cell absolute RSRP measurement accuracy is within the specified limit.

9.9.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and release 11. Applicability requires support for FGI bit 16.

9.9.1.1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in table 9.9.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.1.1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, FDD_C, FDD_D, FDD_E, FDD_F, FDD_G, FDD_H, TDD_A, TDD_C, TDD_E	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.1.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.1.

9.9.1.1.4 Test description

9.9.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.1.1.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.1.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.1.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 1 reported by the UE is compared to actual RSRP value according to Table 9.9.1.1.5-2.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.9.1.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.9.1.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

9.9.1.1.5 Test requirement

Table 9.9.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.1.1.5-2.

Table 9.9.1.1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter	Unit	Test
		Cell 1

E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.1-1			R.0 FDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1-1			R.6 FDD
OCNG Patterns defined in D.1.1-1 (OP.1 FDD)			OP.1 FDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-120.4
	Bands FDD_C		-119.4
	Bands FDD_D		-118.9
	Bands FDD_E, FDD_F Note 5		-118.4
	Bands FDD_G Note 7		-117.4
	Bands FDD_H		-116.9
$\hat{E}_s/I_{ot}$		dB	-4
RSRP Note3	Bands FDD_A	dBm/15 kHz	-124.4
	Bands FDD_C		-123.4
	Bands FDD_D		-122.9
	Bands FDD_E, FDD_F Note 5		-122.4
	Bands FDD_G Note 7		-121.4
	Bands FDD_H		-120.9
RSRQ Note3	Bands FDD_A	dB	-14.93
	Bands FDD_C		
	Bands FDD_D		
	Bands FDD_E, FDD_F Note 5		
	Bands FDD_G Note 7		
	Bands FDD_H		
Io Note3	Bands FDD_A	dBm/9 MHz	-91.16
	Bands FDD_C		-90.16
	Bands FDD_D		-89.66
	Bands FDD_E, FDD_F Note 5		-89.16
	Bands FDD_G Note 7		-88.16
	Bands FDD_H		-87.66

$\hat{E}_s/N_{oc}$	dB	-4
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: Except Band 29 and Band 32.		

Table 9.9.1.1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_9
	Bands FDD_C	RSRP_10
	Bands FDD_D	RSRP_10
	Bands FDD_E Bands FDD_F	RSRP_11
	Bands FDD_G	RSRP_12
	Bands FDD_H	RSRP_12
Highest reported value (Cell 1)	Bands FDD_A	RSRP_24
	Bands FDD_C	RSRP_25
	Bands FDD_D	RSRP_25
	Bands FDD_E Bands FDD_F	RSRP_26
	Bands FDD_G	RSRP_27
	Bands FDD_H	RSRP_27
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_6
	Bands FDD_C	RSRP_7
	Bands FDD_D	RSRP_7
	Bands FDD_E Bands FDD_F	RSRP_8
	Bands FDD_G	RSRP_9
	Bands FDD_H	RSRP_9
Highest reported value (Cell 1)	Bands FDD_A	RSRP_27
	Bands FDD_C	RSRP_28
	Bands FDD_D	RSRP_28
	Bands FDD_E Bands FDD_F	RSRP_29
	Bands FDD_G	RSRP_30
	Bands FDD_H	RSRP_30

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)

9.9.1.1_1.1 Test purpose

Same test purpose as in clause 9.9.1.1.1.

9.9.1.1_1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.9.1.1_1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in table 9.9.1.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.1.1_1.3-1: RSRP FDD Intra frequency absolute accuracy

<table>
<tr><th colspan="2">Accuracy</th><th colspan="5">Conditions</th></tr>
<tr><th rowspan="2">Normal condition</th><th rowspan="2">Extreme condition</th><th rowspan="2">Ês/Iot</th><th colspan="4">Io Note 1 range</th></tr>
<tr><th>E-UTRA operating band groups Note 3</th><th colspan="2">Minimum Io</th><th>Maximum Io</th></tr>
<tr><th>dB</th><th>dB</th><th>dB</th><th></th><th>dBm/15kHz Note 2</th><th>dBm/BW_{Channel}</th><th>dBm/BW_{Channel}</th></tr>
<tr><td rowspan="9">±4.5</td><td rowspan="9">±9</td><td rowspan="9">≥-6 dB</td><td>FDD_A, TDD_A</td><td>-121</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_B</td><td>-120.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_C, TDD_C</td><td>-120</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_D</td><td>-119.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_E, TDD_E</td><td>-119</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_F</td><td>-118.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_G</td><td>-118</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_H</td><td>-117.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>FDD_N</td><td>-114.5</td><td>N/A</td><td>-70</td></tr>
<tr><td>±8</td><td>±11</td><td>≥-6 dB</td><td>FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N</td><td>N/A</td><td>-70</td><td>-50</td></tr>
<tr><td colspan="7">NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.</td></tr>
</table>

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.1.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.1.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.1.

9.9.1.1_1.4 Test description

9.9.1.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.9.1.1.4.1 with the following exceptions:

- Instead of 9.9.1.1.4.3 → use 9.9.1.1_1.4.3.

9.9.1.1_1.4.2 Test procedure

Same test procedure as in clause 9.9.1.1.4.2 with the following exceptions:

- Instead of Table 9.9.1.1.5-1 → use Table 9.9.1.1_1.5-1.
- Instead of Table 9.9.1.1.5-2 → use Table 9.9.1.1_1.5-2.

9.9.1.1_1.4.3 Message contents

Same message contents as in clause 9.9.1.1.4.3.

9.9.1.1_1.5 Test requirement

Table 9.9.1.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.1.1_1.5-2.

Table 9.9.1.1_1.5-1: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)			OP.1 FDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc} Note2	Bands FDD_A Note 8	dBm/15 kHz	-120.4
	Bands FDD_B		-119.9
	Bands FDD_C		-119.4
	Bands FDD_D		-118.9
	Bands FDD_E, FDD_F Note 5		-118.4
	Bands FDD_G Note 7		-117.4
	Bands FDD_H		-116.9
$\hat{E}_s/I_{ot}$		dB	-4
RSRP Note3	Bands FDD_A Note 8	dBm/15 kHz	-124.4
	Bands FDD_B		-123.9
	Bands FDD_C		-123.4
	Bands FDD_D		-122.9
	Bands FDD_E, FDD_F Note 5		-122.4
	Bands FDD_G Note 7		-121.4
	Bands FDD_H		-120.9
RSRQ Note3	Bands FDD_A Note 8	dB	-14.93
	Bands FDD_B		
	Bands FDD_C		
	Bands FDD_D		
	Bands FDD_E, FDD_F Note 5		
	Bands FDD_G Note 7		
	Bands FDD_H		
Io Note3	Bands FDD_A Note 8	dBm/9 MHz	-91.16
	Bands FDD_B		-90.66
	Bands FDD_C		-90.16
	Bands FDD_D		-89.66
	Bands FDD_E, FDD_F Note 5		-89.16

	Bands FDD_G Note 7		-88.16
	Bands FDD_H		-87.66
$\hat{E}_s/N_{oc}$		dB	-4
Propagation condition		-	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: Except Band 29. Note 8: Except Band 32.			

Table 9.9.1.1_1.5-2: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_10
	Bands FDD_B	RSRP_11
	Bands FDD_C	RSRP_11
	Bands FDD_D	RSRP_12
	Bands FDD_E Bands FDD_F	RSRP_12
	Bands FDD_G	RSRP_13
	Bands FDD_H	RSRP_14
Highest reported value (Cell 1)	Bands FDD_A	RSRP_22
	Bands FDD_B	RSRP_23
	Bands FDD_C	RSRP_23
	Bands FDD_D	RSRP_24
	Bands FDD_E Bands FDD_F	RSRP_24
	Bands FDD_G	RSRP_25
	Bands FDD_H	RSRP_26
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands FDD_A	RSRP_6
	Bands FDD_B	RSRP_6
	Bands FDD_C	RSRP_7
	Bands FDD_D	RSRP_7
	Bands FDD_E Bands FDD_F	RSRP_8
	Bands FDD_G	RSRP_9
	Bands FDD_H	RSRP_9
Highest reported value (Cell 1)	Bands FDD_A	RSRP_27
	Bands FDD_B	RSRP_27
	Bands FDD_C	RSRP_28
	Bands FDD_D	RSRP_28
	Bands FDD_E Bands FDD_F	RSRP_29
	Bands FDD_G	RSRP_30
	Bands FDD_H	RSRP_30

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy

9.9.1.2.1 Test purpose

To verify the FDD intra-frequency serving cell absolute RSRQ measurement accuracy is within the specified limit.

9.9.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 10 and forward. Applicability requires support for FGI bit 16.

9.9.1.2.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured of the serving cell.

The accuracy requirements in table 9.9.1.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.9.1.2.3-1: RSRQ FDD intra frequency absolute accuracy

Accuracy		Conditions			
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range		
			E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2

Note 1: Io is assumed to have constant EPRE across the bandwidth.
Note 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
Note 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
Note 4: E-UTRA operating band groups are as defined in Section 3.5.

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.9.1.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.1.2.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.9.1.

9.9.1.2.4 Test description

9.9.1.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.1.2.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.1.2.4.2 Test procedure

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured from the serving cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.1.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of serving Cell 1 reported by the UE is compared to the actual RSRQ according to Table 9.9.1.2.5-2.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.9.1.2.4.3-1: Common Exception messages for RSRQ FDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.9.1.2.4.3-2: *MeasResults*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

9.9.1.2.5 Test requirement

Table 9.9.1.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.9.1.2.5-2.

Table 9.9.1.2.5-1: Cell Specific Test requirement Parameters for RSRQ FDD intra frequency absolute accuracy

Parameter	Unit	Test
		Cell 1

E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.1-1			R.0 FDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1-1			R.6 FDD
OCNG Patterns defined in D.1.1-1 (OP.1 FDD)			OP.1 FDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note1			
OCNG_RB Note1			
N_{oc} Note2	Bands FDD_A	dBm/15 kHz	-120.4
	Bands FDD_C		-119.4
	Bands FDD_D		-118.9
	Bands FDD_E, FDD_F Note 5		-118.4
	Bands FDD_G Note 7		-117.4
	Bands FDD_H		-116.9
$\hat{E}_s/I_{ot}$		dB	-4
RSRP Note3	Bands FDD_A	dBm/15 kHz	-124.4
	Bands FDD_C		-123.4
	Bands FDD_D		-122.9
	Bands FDD_E, FDD_F Note 5		-122.4
	Bands FDD_G Note 7		-121.4
	Bands FDD_H		-120.9
RSRQ Note3	Bands FDD_A	dB	-16.25
	Bands FDD_C		
	Bands FDD_D		
	Bands FDD_E, FDD_F Note 5		
	Bands FDD_G Note 7		
	Bands FDD_H		
Io Note3	Bands FDD_A	dBm/9 MHz	-91.16
	Bands FDD_C		-90.16
	Bands FDD_D		-89.66
	Bands FDD_E, FDD_F Note 5		-89.16
	Bands FDD_G Note 7		-88.16
	Bands FDD_H		-87.66

$\hat{E}_s/N_{oc}$	dB	-4
Propagation condition	-	AWGN
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port. Note 5: For Band 26, the tests shall be performed with the carrier frequency of the assigned E-UTRA channel bandwidth within 865-894 MHz. Note 6: E-UTRA operating band groups are as defined in Section 3.5. Note 7: Except Band 29 and Band 32.		

Table 9.9.1.2.5-2: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_15
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_16

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.2 TDD Serving Cell RSRP and RSRQ Accuracy

9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy

9.9.2.1.1 Test purpose

To verify the TDD intra-frequency serving cell absolute RSRP measurement accuracy is within the specified limit.

9.9.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and release 11. Applicability requires support for FGI bit 16.

9.9.2.1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in Table 9.9.2.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.2.1.3-1: RSRP Intra frequency absolute accuracy

Accuracy		Conditions				
			Io Note 1 range			
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	dBm/$BW_{Channel}$	dBm/$BW_{Channel}$
±6	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, FDD_C, FDD_D, FDD_E, FDD_F, FDD_G, FDD_H, TDD_A, TDD_C, TDD_E	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.2.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.2.

9.9.2.1.4 Test description

9.9.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.2.1.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.2.1.4.2 Test procedure

1. Ensure that the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.2.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check RSRP reported value in periodical MeasurementReport messages. The RSRP value of Cell 1 reported by the UE is compared to actual RSRP value according to Table 9.9.2.1.5-2.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.9.2.1.4.3-1: Common Exception message for RSRP TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.9.2.1.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
}			

9.9.2.1.5 Test requirement

Table 9.9.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.2.1.5-2.

Table 9.9.2.1.5-1: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Special subframe configuration[Note1]			6
Uplink/downlink configuration[Note1]			1
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.2-1			R.0 TDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2-1			R.6 TDD
OCNG Patterns defined in D.2.1-1 (OP.1 TDD)			OP.1 TDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-120.4
	Bands TDD_C		-119.4
	Bands TDD_E		-118.4
$\hat{E}_s/I_{ot}$		dB	-4
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4
	Bands TDD_C		-123.4
	Bands TDD_E		-122.4
RSRQ[Note4]	Bands TDD_A	dB	-14.93
	Bands TDD_C		
	Bands TDD_E		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-91.16
	Bands TDD_C		-90.16
	Bands TDD_E		-89.16
$\hat{E}_s/N_{oc}$		dB	-4
Propagation condition		-	AWGN

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.9.2.1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_9
	Bands TDD_C	RSRP_10
	Bands TDD_E	RSRP_11
Highest reported value (Cell 1)	Bands TDD_A	RSRP_24
	Bands TDD_C	RSRP_25
	Bands TDD_E	RSRP_26
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_6
	Bands TDD_C	RSRP_7
	Bands TDD_E	RSRP_8
Highest reported value (Cell 1)	Bands TDD_A	RSRP_27
	Bands TDD_C	RSRP_28
	Bands TDD_E	RSRP_29

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)

9.9.2.1_1.1 Test purpose

Same test purpose as in clause 9.9.2.1.1.

9.9.2.1_1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 12 and forward. Applicability requires support for FGI bit 16.

9.9.2.1_1.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRP is defined as the RSRP measured of the serving cell.

The accuracy requirements in Table 9.9.2.1_1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP|_{dBm}$ according to Annex I.3.1 for a corresponding Band.

Table 9.9.2.1_1.3-1: RSRP TDD Intra frequency absolute accuracy

Accuracy		Conditions				
Normal condition	Extreme condition	Ês/Iot	Io Note 1 range			
			E-UTRA operating band groups Note 3	Minimum Io		Maximum Io
dB	dB	dB		dBm/15kHz Note 2	$dBm/BW_{Channel}$	$dBm/BW_{Channel}$
±4.5	±9	≥-6 dB	FDD_A, TDD_A	-121	N/A	-70
			FDD_B	-120.5	N/A	-70
			FDD_C, TDD_C	-120	N/A	-70
			FDD_D	-119.5	N/A	-70
			FDD_E, TDD_E	-119	N/A	-70
			FDD_F	-118.5	N/A	-70
			FDD_G	-118	N/A	-70
			FDD_H	-117.5	N/A	-70
			FDD_N	-114.5	N/A	-70
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50
NOTE 1: Io is assumed to have constant EPRE across the bandwidth. NOTE 2: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.						

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.9.2.1_1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.2.1_1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.9.2.

9.9.2.1_1.4 Test description

9.9.2.1_1.4.1 Initial conditions

Same initial conditions as in clause 9.9.2.1.4.1 with the following exceptions:

- Instead of 9.9.2.1.4.3 → use 9.9.2.1_1.4.3.

9.9.2.1_1.4.2 Test procedure

Same test procedure as in clause 9.9.1.1.4.2 with the following exceptions:

- Instead of Table 9.9.2.1.5-1 → use Table 9.9.2.1_1.5-1.
- Instead of Table 9.9.2.1.5-2 → use Table 9.9.2.1_1.5-2.

9.9.2.1_1.4.3 Message contents

Same message contents as in clause 9.9.2.1.4.3.

9.9.2.1_1.5 Test requirement

Table 9.9.2.1_1.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.9.2.1_1.5-2.

Table 9.9.2.1_1.5-1: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Special subframe configuration[Note1]			6
Uplink/downlink configuration[Note1]			1
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)			OP.1 TDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} Note3	Bands TDD_A	dBm/15 kHz	-120.4
	Bands TDD_C		-119.4
	Bands TDD_E		-118.4
$\hat{E}_s/I_{ot}$		dB	-4
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4
	Bands TDD_C		-123.4
	Bands TDD_E		-122.4
RSRQ[Note4]	Bands TDD_A	dB	-14.93
	Bands TDD_C		
	Bands TDD_E		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-91.16
	Bands TDD_C		-90.16
	Bands TDD_E		-89.16
$\hat{E}_s/N_{oc}$		dB	-4
Propagation condition		-	AWGN

NOTE 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
NOTE 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
NOTE 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
NOTE 4:	RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
NOTE 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
NOTE 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.9.2.1_1.5-2: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_10
	Bands TDD_C	RSRP_11
	Bands TDD_E	RSRP_12
Highest reported value (Cell 1)	Bands TDD_A	RSRP_22
	Bands TDD_C	RSRP_23
	Bands TDD_E	RSRP_24
Extreme Conditions	**Test 1**	
Lowest reported value (Cell 1)	Bands TDD_A	RSRP_6
	Bands TDD_C	RSRP_7
	Bands TDD_E	RSRP_8
Highest reported value (Cell 1)	Bands TDD_A	RSRP_27
	Bands TDD_C	RSRP_28
	Bands TDD_E	RSRP_29

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy

9.9.2.2.1 Test purpose

To verify the TDD intra-frequency serving cell absolute RSRQ measurement accuracy is within the specified limit.

9.9.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 10 and forward. Applicability requires support for FGI bit 16.

9.9.2.2.3 Minimum conformance requirements

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured of the serving cell.

The accuracy requirements in table 9.9.2.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex I.3.1 for a corresponding Band.

Table 9.9.2.2.3-1: RSRQ TDD intra frequency absolute accuracy

Accuracy		Conditions			
			Io Note 1 range		
Normal condition	Extreme condition	Ês/Iot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io
dB	dB	dB		dBm/15kHz Note 3	$dBm/BW_{Channel}$
±2.5	±4	≥-3 dB	FDD_A, TDD_A	-121	-50
			FDD_C, TDD_C	-120	-50
			FDD_D	-119.5	-50
			FDD_E, TDD_E	-119	-50
			FDD_F	-118.5	-50
			FDD_G	-118	-50
			FDD_H	-117.5	-50
			FDD_N	-114.5	-50
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: The same bands and the same Io conditions for each band apply for this requirement as for the corresponding highest accuracy requirement. Note 3: The condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. Note 4: E-UTRA operating band groups are as defined in Section 3.5.					

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.9.2.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.9.2.2.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.9.2.

9.9.2.2.4 Test description

9.9.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.9.2.2.4.3.

4. Cell 1 is the serving cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.9.2.2.4.2 Test procedure

The serving cell absolute accuracy of RSRQ is defined as the RSRQ measured from the serving cell 1.

1. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 7.2A.3.

2. Set the parameters according to Table 9.9.2.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. After 10s wait from Step 3, SS shall check the RSRQ value in periodical MeasurementReport messages. The RSRQ value of serving Cell 1 reported by the UE is compared to the actual RSRQ according to Table 9.9.2.2.5-2.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

9.9.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.9.2.2.4.3-1: Common Exception messages for RSRQ TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.9.2.2.4.3-2: *MeasResults*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

9.9.2.2.5 Test requirement

Table 9.9.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.9.2.2.5-2.

Table 9.9.2.2.5-1: Cell Specific Test requirement Parameters for RSRQ TDD intra frequency absolute accuracy

Parameter		Unit	Test
			Cell 1
E-UTRA RF Channel Number			1
$BW_{channel}$		MHz	10
Antenna Configuration			1x2
Special subframe configuration[Note1]			6
Uplink/downlink configuration[Note1]			1
Measurement bandwidth		n_{PRB}	22—27
PDSCH Reference measurement channel defined in A.1.2-1			R.0 TDD
PDSCH allocation		n_{PRB}	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2-1			R.6 TDD
OCNG Patterns defined in D.2.1-1 (OP.1 TDD)			OP.1 TDD
PBCH_RA		dB	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA[Note2]			
OCNG_RB[Note2]			
N_{oc} [Note3]	Bands TDD_A	dBm/15 kHz	-120.4
	Bands TDD_C		-119.4
	Bands TDD_E		-118.4
$\hat{E}_s/I_{ot}$		dB	-4
RSRP[Note4]	Bands TDD_A	dBm/15 kHz	-124.4
	Bands TDD_C		-123.4
	Bands TDD_E		-122.4
RSRQ[Note4]	Bands TDD_A	dB	-16.25
	Bands TDD_C		
	Bands TDD_E		
Io[Note4]	Bands TDD_A	dBm/9 MHz	-91.16
	Bands TDD_C		-90.16
	Bands TDD_E		-89.16
$\hat{E}_s/N_{oc}$		dB	-4
Propagation condition		-	AWGN

Note 1:	For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in TS 36.211.
Note 2:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4:	RSRP, RSRQ and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 6:	E-UTRA operating band groups are as defined in Section 3.5.

Table 9.9.2.2.5-2: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1
	All bands
Normal Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_15
Extreme Conditions	
Lowest reported value (Cell 1)	RSRQ_00
Highest reported value (Cell 1)	RSRQ_16

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

10 Proximity-based Services in Any Cell Selection

10.1 FFS

10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication

Editor’s note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Message contents are TBD.

- Connection diagrams are TBD

- Annex E updates are pending.

10.2.1 Test purpose

To verify the ProSe UE’s ability to initiate and cease SLSS transmissions during cell selection state and if the UE meets the maximum evaluation time.

10.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward which support ProSe Direct Communication.

10.2.3 Minimum conformance requirements

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.84 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.84 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.8 sec (clause 11.3.2) for the parameters in this test;

SLSS period is set as 40ms in this test.

The normative reference for this requirement is TS 36.133 [4] clause 11.3, and A.10.2.

10.2.4 Test description

10.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz or 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 10.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 10.2.4.3.
5. There no active cells in this test case during the actual test loop, and SS is expected to simulate a reference UE, SyncRef UE 1. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 10.2.4.1-1: Test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	Value	Comment
E-UTRA RF Channel Number		1	
Channel Bandwidth ($BW_{channel}$)	MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell		None	
Active SyncRef UE		SyncRef UE 1	Transmitting SLSS+MIB-SL on uplink of RF channel number 1
ProSe Direct Communication preconfiguration		As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOoC	dBm/15 kHz	-95	
T1	s	3	
T2	s	5.24	
T3	s	5.24	

Table 10.2.4.1-2: SyncRef UE specific test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1) Note resource pool is same as Configuration #2 used by ProSe UE.		
syncOffsetIndicator		Set same as *syncOffsetIndicator1* in ProSe Direct Communication preconfiguration		
slssid		30		
inCoverage		TRUE		
networkControlledSyncTx		ON		
N_{oc} Note1	dBm/15 kHz	-96		
$\hat{E}_s/N_{oc}$	dB	5.5	-3.5	5.5
S-RSRP Note2, Note3	dBm/15 kHz	-90.5	-99.5	-90.5
Propagation Condition		AWGN		
Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.				
Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				
Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.				
Note 4: This test is according to the principle defined in section A.3.12.3.				

10.2.4.2 Test procedure

There are no active cells in this test. There is one active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every synchronization period Prior to start of test, test system is required to ensure that the ProSe UE is synchronized to the SyncRef UE 1 and is transmitting SLSS + MIB-SL as derived from the SLSS + MIB-SL of SyncRef. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. During T1, the S-RSRP of SyncRef UE 1 is above *syncTxThreshOOC* and the UE is not expected to be transmitting SLSS. During T2, the S-RSRP of SyncRef UE 1 is lowered below *syncTxThreshOOC* and the UE is expected to initiate SLSS transmissions. During T3, the S-RSRP of SyncRef UE 1 is increased back to be above *syncTxThreshOOC* and the UE is expected to cease SLSS transmissions.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode E is activated on a EUTRA cell.

2. EUTRA cell is powered down for the remaining duration of the test case. SS would ensure that it enables a SyncRefUE1 at this stage and the ProSe UE under test is synchronized to SyncRefUE1.
3. Set the parameters according to T1 in Table 10.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
4. During T1, SS checks if the UE is not transmitting SLSS.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 10.2.5-1.
6. UE is expected to initiate a SLSS transmissions inside 0.84 s from the start of T2. If the UE initiates SLSS transmission consider the loop to be pass, else the loop is considered as fail.
7. After the SS is able to measure the SLSS in step 6) or when T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 10.2.5-1
8. UE is expected to cease SLSS transmission inside 0.84s from the start of T3. If the UE ceases SLSS transmission consider the loop to be pass, else the loop is considered as fail.
9. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 4 with test loop mode E activated according to TS 36.508 [7] clause 4.5.4.
10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved for both the events.

10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with FFS:

Table 10.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	FFS

10.2.5 Test requirement

Tables 10.2.4.1-2 and 10.2.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-Initiation/Cease of SLSS Transmission with ProSe Direct Discovery.

Table 10.2.5-1: SyncRef UE specific test parameters for initiation/cease of SLSS transmissions test for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$ Note 4	MHz	5 or 10		
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1) Note resource pool is same as Configuration #2 used by ProSe UE.		
syncOffsetIndicator		Set same as *syncOffsetIndicator1* in ProSe Direct Communication preconfiguration		
slssid		30		
inCoverage		TRUE		
networkControlledSyncTx		ON		

N_{oc} Note1	dBm/15 kHz	-96		
$\hat{E}_s/N_{oc}$	dB	6.1	-4.1	6.1
S-RSRP Note2, Note3	dBm/15 kHz	-89.9	-100.1	-89.9
Propagation Condition		AWGN		
Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot. Note 4: This test is according to the principle defined in section A.3.12.3.				

The SLSS transmission initiation delay is defined as the time from the beginning of time period T2 up to the moment when the UE initiates the SLSS transmission.

The SLSS transmission initiation delay shall be less than 0.84 s.

The SLSS transmission cease delay is defined as the time from the beginning of time period T3 up to the moment when the UE ceases the SLSS transmission.

The SLSS transmission cease delay shall be less than 0.84 s.

The rate of correct initiation/cease delay of SLSS transmissions observed during repeated tests shall be at least 90%.

NOTE: The initiation/cease delay of SLSS transmissions can be expressed as: $T_{evaluate,SLSS}$ + SLSS period,

Where:

$T_{evaluate,SLSS}$ is the evaluation time for initiate/cease of SLSS, and is 0.8 sec (clause 11.3.2) for the parameters in this test;

SLSS period is set as 40ms in this test.

10.3 FFS

10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- Message contents are TBD.

- Connection diagrams are TBD

- Annex E updates are pending.

10.4.1 Test purpose

The purpose of this test is to verify cell identification delay requirement for a newly detectable cell on the downlink frequency associated with the pre-configured ProSe carrier frequency in Any Cell Selection.

10.4.2 Test applicability

This test case applies to all types of E-UTRA UE release 12 and forward which support ProSe Direct Communication.

10.4.3 Minimum conformance requirements

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier is defined as the time from the beginning of T2 to the time UE camps on the cell and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST.

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier shall be less than 7.68 s.

The cell selection delay can be expressed as $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON} + T_{SI}$, where

- $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON}$ = 6.4sec as specified in sub-clause 11.4.2.2
- T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case

This gives a total of 7.68 sec.

The normative reference for this requirement is TS 36.133 [4] clause 11.4, and A.10.4.

10.4.4 Test description

10.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.

Channel Bandwidth to be tested: 5 MHz or 10 MHz as defined in TS 36.508 [7] clause 4.3.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure FFS.
2. The general test parameter settings are set up according to Table 10.4.4.1-2.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 10.4.4.3.
5. There is one active cell (Cell 1) and active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every SLSS period (40ms).

Table 10.4.4.1-1: Test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter		Unit	Value	Comment
Initial condition	Active synchronization source		Sync Ref UE 1	
Final condition	Active synchronization source		Cell1	
E-UTRA RF Channel Number			1	
Channel Bandwidth ($BW_{channel}$)		MHz	5 or 10	According to principle defined in clause A.3.12.3
Active cell			Cell1	
Active SyncRef UEs			SyncRef UE 1	Transmitting SLSS+MIB-SL on uplink of RF channel number 1
ProSe Direct Communication preconfiguration			As specified in Table A.3.12.5-2 (Configuration #2)	IE values unless specified otherwise in this test.
syncTxThreshOoC			11 (+infinity)	
T1		s	2	
T2		s	30	

Table 10.4.4.1-2: Cell specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$ Note 4	MHz	5 or 10	
OCNG Patterns defined in A.3.2.1.2 Note 4		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note 1			
OCNG_RB Note 1			
N_{oc} Note2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	-infinity	-3
RSRP Note3	dBm/15 kHz	-infinity	-101
SCH_RP Note3	dBm/15 kHz	-infinity	-101
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: This test is according to the principle defined in section A.3.12.3.

Table 10.4.4.1-3: SyncRef UE specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1	
		T1	T2
E-UTRA RF Channel Number		1 (Uplink)	
$BW_{channel}$ Note 4	MHz	5 or 10	
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1)	
networkControlledSyncTx		ON	
slssid		30	
inCoverage (in MIB-SL)		TRUE	
syncOffsetIndicator		syncOffsetIndicator1	
N_{oc} Note1	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	13	
S-RSRP Note2, Note3	dBm/15 kHz	-85	
Propagation Condition		AWGN	

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot.
Note 4: This test is according to the principle defined in section A.3.12.3.

10.4.4.2 Test procedure

There is one active cell (Cell 1) and active SyncRef UE (SyncRef UE 1) in this test. The test system shall emulate SyncRef UE 1 to transmit SLSS and MIB-SL every SLSS period (40ms). The test consists of two successive time periods, with time duration of T1 and T2 respectively. During T1, the cell is powered OFF and the ProSe UE is synchronized to SyncRef UE 1. During T2, the cell is powered ON and the ProSe UE will detect the cell and attempt to camp on the cell.

1 Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and UE test loop Mode D is activated.

2. Set the parameters according to T1 in Table 10.4.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.

3. At the start of T1, cell 1 is powered off and UE is expected to synchronize with SyncRefUE1.Also TE is expected to verify that UE is able to transmit SLSS + MIB-SL before the end of T1.

3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 10.4.5-1.

4. UE is expected to initiate PRACH preambles inside 7.68 s from the start of T2. If the UE sends PRACH inside 7.68s consider the loop to be pass, else UE fails the iteration.

5. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

6. After the RRC connection release, the SS switches off and on the UE and ensures the UE is in State 4 with test loop mode 4 activated according to TS 36.508 [7] clause 4.5.4.

7. Repeat step 2-6 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

10.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with FFS:

Table 10.4.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	FFS

10.4.5 Test requirement

Tables 10.4.4.1-1 and 10.4.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-Initiation/Cease of SLSS Transmission with ProSe Direct Discovery.

Table 10.4.5-1: Cell specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD (when UE is transmitting for ProSe)

Parameter	Unit	Cell 1	
		T1	T2

E-UTRA RF Channel Number		1	
$BW_{channel}$ Note 4	MHz	5 or 10	
OCNG Patterns defined in A.3.2.1.2 Note 4		5 MHz: OP.16 FDD 10 MHz: OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
PDSCH_RA			
PDSCH_RB			
OCNG_RA Note 1			
OCNG_RB Note 1			
N_{oc} Note2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	-infinity	-2.4
RSRP Note3	dBm/15 kHz	-infinity	-100.4
SCH_RP Note3	dBm/15 kHz	-infinity	-100.4
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: This test is according to the principle defined in section A.3.12.3.			

Table 10.4.5-2: SyncRef UE specific test parameters for cell identification test on downlink frequency associated with ProSe frequency for E-UTRAN FDD

Parameter	Unit	SyncRef UE 1	
		T1	T2
E-UTRA RF Channel Number		1 (Uplink)	
$BW_{channel}$ Note 4	MHz	5 or 10	
ProSe Direct Communication resource pool configuration		As specified in Table A.3.12.5-1 (Configuration #1)	
networkControlledSyncTx		ON	
slssid		30	
inCoverage (in MIB-SL)		TRUE	
syncOffsetIndicator		syncOffsetIndicator1	
N_{oc} Note1	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	13	
S-RSRP Note2, Note3	dBm/15 kHz	-85	
Propagation Condition		AWGN	
Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 2: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 3: SSSS Es/Iot is set the same as PSSS/PSBCH Es/Iot. Note 4: This test is according to the principle defined in section A.3.12.3.			

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier is defined as the time from the beginning of T2 to the time UE camps on the cell and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST.

The cell selection delay to a newly detectable cell on the downlink associated with the preconfigured ProSe carrier shall be less than 7.68 s.

The cell selection delay can be expressed as $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON}$ + T_{SI}, where

- $T_{basic\_identify\_OoC\_ProSe\ Tx\_ON}$ = 6.4sec as specified in sub-clause 11.4.2.2
- T_{SI} = Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case

This gives a total of 7.68 sec.

Annex A (normative): Reference Measurement Channels

A.1 PDSCH

A.1.1 FDD

Table A.1.1-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value								
Reference channel		R.2 FDD		R.5 FDD	R.7 FDD	R.0 FDD	R.1 FDD	R.3 FDD	R.4 FDD	R.6 FDD
Channel bandwidth	MHz	1.4	3	5	5	10	10	10	20	20
Number of transmitter antennas		1		1	1	1	2	1	1	1
Allocated resource blocks (Note 4)		2		11	11	24	24	24	24	24
Allocated subframes per Radio Frame		10		10	10	10	10	10	10	10
Modulation		QPSK		QPSK	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Target Coding Rate		1/3		1/3	1/3	1/3	1/3	1/3	1/3	1/3
Information Bit Payload										
For Sub-Frames 4, 9	Bits	120		968	968	2088	2088	2088	2088	2088
For Sub-Frame 5	Bits	104		776	776	2088	1736	2088	2088	2088
For Sub-Frame 0	Bits	32		616	616	1736	1736	1736	1736	1736
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0		0	968	0	0	2088	0	2088
Number of Code Blocks per Sub-Frame (Note 5)										
For Sub-Frames 4, 9		1		1	1	1	1	1	1	1
For Sub-Frame 5		1		1	1	1	1	1	1	1
For Sub-Frame 0		1		1	1	1	1	1	1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		0		0	1	0	0	1	0	1
Binary Channel Bits Per Sub-Frame										
For Sub-Frames 4, 9	Bits	456		2772	2772	6624	6336	6624	6624	6624
For Sub-Frame 5	Bits	360		2484	2484	6336	6048	6336	6336	6336
For Sub-Frame 0	Bits	176		1932	1932	5784	5520	5784	5784	5784
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0		0	2772	0	0	6624	0	6624
Max. Throughput averaged over 1 frame	kbps	37.6		332.8	913.6	800	765	2053	800	2053

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.2 TDD

Table A.1.2-1: PDSCH Reference Measurement Channels for TDD UL/DL configuration1

Parameter	Unit	Value					
Reference channel		R.2 TDD		R.4 TDD	R.0 TDD	R.1 TDD	R.3 TDD
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1		1	1	2	1
Allocated resource blocks (Note 4)		2		11	24	24	24
Uplink-Downlink Configuration (Note 5)		1		1	1	1	1
Special Subframe Configuration (Note 6)		6		6	6	6	6
Allocated subframes per Radio Frame		6		6	6	6	6
Modulation		QPSK		QPSK	QPSK	QPSK	QPSK
Target Coding Rate		1/3		1/3	1/3	1/3	1/3
Information Bit Payload							
For Sub-Frames 4,9	Bits	120		968	2088	2088	2088
For Sub-Frame 5	Bits	104		968	2088	2088	2088
For Sub-Frame 0	Bits	56		616	2088	1736	2088
For Sub-Frame 1, 6 (DwPTS)	Bits	56		552	1032	1032	1032
Number of Code Blocks per Sub-Frame (Note 7)				1			1
For Sub-Frames 4,9		1		1	1	1	1
For Sub-Frame 5		1		1	1	1	1
For Sub-Frame 0		1		1	1	1	1
For Sub-Frame 1, 6 (DwPTS)		1		1	1	1	1
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits	456		2772	6624	6336	6624
For Sub-Frame 5	Bits	408		2628	6480	6192	6480
For Sub-Frame 0	Bits	224		2076	5928	5664	5928
For Sub-Frame 1, 6 (DwPTS)	Bits	272		1616	3696	3504	3696
Max. Throughput averaged over 1 frame	Mbps	0.05612		0.4624	1.0416	1.0064	1.0416

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].4 symbols allocated to PDCCH for 1.4 MHz channel BW.
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 4: Allocation is located in the middle of bandwidth. If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 5: As per Table 4.2-2 in TS 36.211 [9].
Note 6: As per Table 4.2-1 in TS 36.211 [9].
Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

Table A.1.2-2: PDSCH Reference Measurement Channels for TDD UL/DL configuration0

Parameter	Unit	Value					
Reference channel					R.5 TDD		
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas					1		
Allocated resource blocks (Note 4)					24		
Uplink-Downlink Configuration (Note 5)					0		
Special Subframe Configuration (Note 6)					6		
Allocated subframes per Radio Frame					4		
Modulation					QPSK		
Target Coding Rate					1/3		
Information Bit Payload							
For Sub-Frames 4,9	Bits				N/A		
For Sub-Frame 5	Bits				2088		
For Sub-Frame 0	Bits				2088		
For Sub-Frame 1, 6 (DwPTS)	Bits				1032		
Number of Code Blocks per Sub-Frame (Note 7)					1		
For Sub-Frames 4,9					N/A		
For Sub-Frame 5					1		
For Sub-Frame 0					1		
For Sub-Frame 1, 6 (DwPTS)					1		
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits				N/A		
For Sub-Frame 5	Bits				6480		
For Sub-Frame 0	Bits				5928		
For Sub-Frame 1, 6 (DwPTS)	Bits				3696		
Max. Throughput averaged over 1 frame	Mbps				0.624		

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: As per Table 4.2-2 in TS 36.211 [9].
Note 6: As per Table 4.2-1 in TS 36.211 [9].
Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.3 FDD for UE Category 0

Table A.1.3-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value		
Reference channel		R.13 FDD	R.14 FDD	R.15 FDD
Channel bandwidth	MHz	10	10	10
Number of transmitter antennas		1	2	2
Allocated resource blocks (Note 4)		24	24	24
Allocated subframes per Radio Frame		10	10	10
Modulation		QPSK	QPSK	QPSK
Target Coding Rate		1/10	1/10	1/10
Information Bit Payload				
For Sub-Frames 4, 9	Bits	648	648	648
For Sub-Frame 5	Bits	648	648	648
For Sub-Frame 0	Bits	648	648	648
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0	648
Number of Code Blocks per Sub-Frame (Note 5)				
For Sub-Frames 4, 9		1	1	1
For Sub-Frame 5		1	1	1
For Sub-Frame 0		1	1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		1	1	1
Binary Channel Bits Per Sub-Frame				
For Sub-Frames 4, 9	Bits	6624	6336	6636
For Sub-Frame 5	Bits	6336	6048	6408
For Sub-Frame 0	Bits	5784	5520	5520
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0	6636
Max. Throughput averaged over 1 frame	kbps	259.2	259.2	648

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.4 HD-FDD for UE Category 0

Table A.1.4-1: PDSCH Reference Measurement Channels for HD-FDD

Parameter	Unit	Value	
Reference channel		R.1 HD-FDD	R.2 HD-FDD
Channel bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks (Note 4)		24	24
Allocated subframes per Radio Frame		10	10
Modulation		QPSK	QPSK
Target Coding Rate		1/10	1/10
Information Bit Payload			
For Sub-Frames 4, 9,	Bits	0	0
For Sub-Frame 5 (Note 7)	Bits	424	424
For Sub-Frame 0 (Note 7)		648	648
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0
For Sub-Frame 1, 6	Bits		
Number of Code Blocks per Sub-Frame (Note 5)			
For Sub-Frames 4, 9		1	1
For Sub-Frame 5		1	1
For Sub-Frame 0		1	1
For Sub-Frame 1, 2, 3, 6, 7, 8		1	1
Binary Channel Bits Per Sub-Frame			
For Sub-Frames 4, 9	Bits	0	0
For Sub-Frame 5	Bits	6336	6048
For Sub-Frame 0	Bits	5784	5520
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0	0
Max. Throughput averaged over 1 frame	kbps		

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 7: Sub-frame 0 or sub-frame 5 is randomly scheduled in downlink.

A.1.5 TDD for UE Category 0

Table A.1.5-1: PDSCH Reference Measurement Channels for TDD UL/DL configuration1

Parameter	Unit	Value	
Reference channel		R.12 TDD	R.13 TDD
Channel bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks (Note 4)		24	24
Uplink-Downlink Configuration (Note 5)		1	1
Special Subframe Configuration (Note 6)		6	6
Allocated subframes per Radio Frame		6	6
Modulation		QPSK	QPSK
Target Coding Rate		1/10	1/10
Information Bit Payload			
For Sub-Frames 4,9	Bits	648	648
For Sub-Frame 5	Bits	648	648
For Sub-Frame 0	Bits	648	648
For Sub-Frame 1, 6 (DwPTS)	Bits	488	488
Number of Code Blocks per Sub-Frame (Note 7)		1	1
For Sub-Frames 4,9		1	1
For Sub-Frame 5		1	1
For Sub-Frame 0		1	1
For Sub-Frame 1, 6 (DwPTS)		1	1
Binary Channel Bits Per Sub-Frame			
For Sub-Frames 4,9	Bits	6624	6336
For Sub-Frame 5	Bits	6580	6192
For Sub-Frame 0	Bits	5928	5664
For Sub-Frame 1, 6 (DwPTS)	Bits	3696	3408
Max. Throughput averaged over 1 frame	Mbps	0.3552	0.3552

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 3 OFDM symbols allocated to PDCCH for 5MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: As per Table 4.2-2 in TS 36.211 [9]
Note 6: As per Table 4.2-1 in TS 36.211 [9]
Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.6 Frame Structure 3

Table A.1.6-1: PDSCH Reference Measurement Channels for FS 3

Parameter	Unit	Value				
Reference channel					R.0 FS3	
Channel bandwidth	MHz				20	
Number of transmitter antennas					1	
Allocated resource blocks (Note 4)					24	
Allocated subframes per Radio Frame					10	
Modulation					QPSK	
Target Coding Rate					1/3	
Information Bit Payload						
For Sub-Frames 4, 9	Bits				2088	
For Sub-Frame 5	Bits				2088	
For Sub-Frame 0	Bits				2088	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits				2088	
Number of Code Blocks per Sub-Frame (Note 5)						
For Sub-Frames 4, 9					1	
For Sub-Frame 5					1	
For Sub-Frame 0					1	
For Sub-Frame 1, 2, 3, 6, 7, 8					1	
Binary Channel Bits Per Sub-Frame						
For Sub-Frames 4, 9	Bits				6624	
For Sub-Frame 5	Bits				6336	
For Sub-Frame 0	Bits				6336	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits				6624	
Max. Throughput averaged over 1 frame	kbps				2088	

Note 1: 2 symbols allocated to PDCCH for 20 MHz channel BW.
Note 2: Reference signal, synchronization signals allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 7: PDSCH allocation applies only to subframes where there is no DRS transmission
Note 8: PDSCH is not transmitted in subframes where it is determined that transmission should not occur according to the listen before talk (LBT model).
Note 9: Max throughput averaged over 1 frame does not account for missed PDSCH transmission due to LBT or DRS transmission

A.2 PCFICH/PDCCH/PHICH

A.2.1 FDD

Table A.2.1-1: PCFICH/PDCCH/PHICH Reference Channel for FDD

Parameter	Unit	Value							
Reference channel		R.8 FDD	R.11 FDD	R.12 FDD	R.10 FDD	R.13 FDD	R.6 FDD	R.7 FDD	R.9 FDD
Channel bandwidth	MHz	1.4	5	5	20	20	10	10	10
Number of transmitter antennas		1	1	2	1	2	1	2	2
Control region OFDM symbols[Note1]	symbols	4	3	3	2	2	2	2	3
Aggregation level	CCE	2 (Note 6)	8	8	8	8	8	8	8
DCI Format		Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5

Note 1: The control region consists of PCFICH, PHICH and PDCCH.
Note 2: DCI formats are defined in TS 36.212.
Note 3: DCI format shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: Payload size shall depend upon the test configuration.
Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.2.2 TDD

Table A.2.2-1: PCFICH/PDCCH/PHICH Reference Channel for TDD

Parameter	Unit	Value							
Reference channel		R.8 TDD	R11 TDD	R.12 FDD	R.10 TDD	R.13 TDD	R.6 TDD	R.7 TDD	R.9 TDD
Channel bandwidth	MHz	1.4	5	5	20	20	10	10	10
Number of transmitter antennas		1	1	2	1	2	1	2	2
Control region OFDM symbols[Note1]	symbols	4 (Note 6)	3	3	2	2	2	2	3
Aggregation level	CCE	2 (Note 7)	8	8	8	8	8	8	8
DCI Format		Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5	Note 5

Note 1: The control region consists of PCFICH, PHICH and PDCCH.
Note 2: DCI formats are defined in 3GPP TS 36.212.
Note 3: DCI format shall depend upon the test configuration.
Note 4: Cell ID shall depend upon the test configuration.
Note 5: Payload size shall depend upon the test configuration.
Note 6: Only 2 OFDM symbols for special subframes 1 and 6.
Note 7: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.2.3 HD-FDD for UE category 0

Table A.2.3-1: PCFICH/PDCCH/PHICH Reference Channel for HD-FDD

Parameter	Unit	Value		
Reference channel		R.3 HD-FDD	R.4 HD-FDD	R.5 HD-FDD
Channel bandwidth	MHz	10	10	10
Number of transmitter antennas		1	2	2
Control region OFDM symbols[Note1]	symbols	2	2	3
Aggregation level	CCE	8	8	8
DCI Format		Note 3	Note 3	Note 3
Cell ID		Note 4	Note 4	Note 4
Payload (without CRC)	Bits	Note 5	Note 5	Note 5
Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCI formats are defined in TS 36.212. Note 3: DCI format shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration. Note 5: Payload size shall depend upon the test configuration. Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used. Note 7: Sub-frame 0 or sub-frame 5 is randomly scheduled in downlink.				

A.2.4 FS 3

Table A.2.4-1: PCFICH/PDCCH/PHICH Reference Channel for FS 3

Parameter	Unit	Value				
Reference channel					R.0 FS3	
Channel bandwidth	MHz	10	10	10	20	
Number of transmitter antennas					1	
Control region OFDM symbols[Note1]	symbols				2	
Aggregation level	CCE				8	
DCI Format					Note 3	
Cell ID					Note 4	
Payload (without CRC)	Bits				Note 5	
Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCI formats are defined in TS 36.212. Note 3: DCI format shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration. Note 5: Payload size shall depend upon the test configuration. Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used. Note 7: PCFICH/PDCCH/PHICH allocation applies only to subframes where there is no DRS transmission Note 8: PCFICH/PDCCH/PHICH are not transmitted in subframes where it is determined that transmission should not occur according to the listen before talk (LBT model).						

A.3 PUSCH

This rule applies to E-UTRA cell(s), which the UE is connected to. The UE is in RRC-CONNECTED mode.

When signalling or data payloads are expected to be sent on the PUSCH, the UE may be provided in advance with PUSCH resources by the SS. For sake of simplicity the PUSCH scheduling may also occur continuously over many consecutive subframes. These options shall not be used if:
1) stated otherwise in the test description, or
2) the transmission of PUSCH and UL scheduling information affects the test purpose (e.g. DRX, PUCCH reception etc.)

For handover test cases, after RRC Connection reconfiguration message implying handover is sent, the UE shall be provided continuously with PUSCH resources by the SS in the source cell. This is done in order to make the requirement UE implementation agnostic, w.r.t. different delays caused by different handling of positive RLC acknowledgements, which are not mandatory and of lower priority than the handover procedure progress (subclause 5.3.5.4 [5]).

If a PUSCH scheduling occurs, the SS sends uplink scheduling information via PDCCH DCI format 0 for C-RNTI to the UE. The UE sends uplink MAC padding bits on the PUSCH.

A.4 Reference Measurement Channels for ProSe Direct Discovery

A.4.1 FDD

Table A.4.1-1: PSDCH Reference Measurement Channels for FDD

Parameter	Unit	Value
Reference channel		D.1 FDD
Channel bandwidth	MHz	5
Allocated resource blocks		2
Subcarriers per resource block		12
Allocated subframes per Discovery period		1
DFT-OFDM Symbols per subframe (see note)		11
Modulation		QPSK
Information Bit Payload		232
Transport block CRC	Bits	24
Maximum number of HARQ transmissions		1
Binary Channel Bits (see note)	Bits	528
NOTE1: PSDCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.		

A.5 Reference measurement channels for ProSe Direct Communication

A.5.1 FDD

Table A.5.1-1: PSCCH Reference Measurement Channels for FDD

Parameter		Unit	Value	
Reference channel			CC.1 FDD	CC.2 FDD
Channel bandwidth		MHz	5	10
Allocated resource blocks			1	1
Subcarriers per resource block			12	12
DFT-OFDM Symbols per subframe (see Note 1)			11	11
Modulation			QPSK	QPSK
Information Bit Payload		Bits	41	43
Information bits	Frequency hopping flag		0	
	RB assignment		Set as per PSSCH RB allocation specific in the test	
	Time resource pattern (I_{TRP})		0 (Note 2)	
	Modulation and coding scheme		Set as the PSSCH MCS specified in the test	
	Timing advance indication		0	
	Group destination ID		As set by higher layers	

Transport block CRC	Bits	16	16
Maximum number of HARQ transmissions		2	2
Binary Channel Bits (see Note 1)	Bits	264	264
NOTE1: PSCCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211. NOTE 2: For N_{TRP} = 8 (FDD) and *trpt-Subset* = 001, I_{TRP} = 0 corresponds to a time repetition pattern of (1,0,0,0,0,0,0,0) as per TS 36.213.			

Table A.5.1-2: PSSCH Reference Measurement Channels for FDD

Parameter	Unit	Value	
Reference channel		CD.1 FDD	CD.2 FDD
Channel bandwidth	MHz	5	10
Allocated resource blocks		2	3
Subcarriers per resource block		12	12
DFT-OFDM Symbols per subframe (see Note 1)		11	11
Modulation		QPSK	QPSK
Target Code Rate		1/3	1/3
Information Bit Payload		176	256
Transport block CRC	Bits	24	24
Maximum number of HARQ transmissions		3	3
Binary Channel Bits (see note)	Bits	528	1056
NOTE1: PSDCH transmissions are rate-matched for 12 DFT-OFDM symbols per subframe, and the last symbol shall be punctured as per TS 36.211.			

A.6 ProSe Receive Traffic Generator

This clause defines the configuration for active Sidelink UEs used to generate receive traffic in ProSe RRM tests.

A.6.1 ProSe Direct Communication Receive Traffic Generator for FDD

Table A.6.1-1: Active Sidelink UE configuration for ProSe Direct Communication

Configuration			PCP.1.FDD
Channel BW		MHz	5 or 10
Number of Active Sidelink UEs per sc-period			5 MHz: 12 10 MHz: 16
Active Sidelink UEs	PSCCH RMC (defined in A.5)		5 MHz: CC.1 FDD 10 MHz: CC.2 FDD
	PSCCH resource allocation		5MHz: [2i:2i], for Sidelink UE i=0,..,11 10MHz:[3i:3i], for Sidelink UE i = 0, .., 15
	PSSCH RMC (defined in A.5)		5 MHz: CD.1 FDD 10 MHz: CD.2 FDD
	PSSCH resource allocation		Non-overlapping RBs 5MHz: [2i:2i+1], for Sidelink UE i = 0, .., 11 10MHz:[3i:3i+2], for Sidelink UE i = 0, .., 15
	RSRP	dBm/15kHz	-98

A.6.2 ProSe Direct Discovery Receive Traffic Generator for FDD

Table A.6.2-1: Active Sidelink UE configuration for ProSe Direct Discovery

Configuration			PDP.1.FDD	PDP.2.FDD
Channel BW		MHz	5	
Number of Active Sidelink UEs per Discovery subframe			12	
Active Sidelink UEs	Sidelink UE Transmissions		PSDCH (RMC D.1 FDD)	PSDCH (RMC D.1 FDD) + SLSS on synchronization subframe
	Resource allocation		Non overlapping RBs in a subframe	
	RSRP	dBm/15kHz	-95	

A.7 MPDCCH Reference Channels for Cat-M1 UEs

A.7.1 FDD in CEModeA

Table A.7.1-1: MPDCCH Reference Channel for Cat-M1 FDD UEs in CEModeA

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.16 FDD	R.17 FDD	R.24 FDD	R.25 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1A	6-1A	6-1A	6-1A
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	4	4	4	4
Aggregation level	ECCE	16	16	16	16
Maximum number of repetitions	-	8	8	8	8
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4
Payload (without CRC)	Bits	Note 1	Note 1	Note 1	Note 1
Cell ID	-	Note 2	Note 2	Note 2	Note 2
Note 1: Payload size shall depend upon the test configuration. Note 2: Cell ID shall depend upon the test configuration.					

A.7.2 HD-FDD in CEModeA

Table A.7.2-1: MPDCCH Reference Channel for Cat-M1 HD-FDD UEs in CEModeA

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.6 HD-FDD	R.7 HD-FDD	R.14 HD-FDD	R.15 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1A	6-1A	6-1A	6-1A
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	4	4	4	4
Aggregation level	ECCE	16	16	16	16
Maximum number of repetitions	-	8	8	8	8
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4
Payload (without CRC)	Bits	Note 1	Note 1	Note 1	Note 1
Cell ID	-	Note 2	Note 2	Note 2	Note 2
Note 1: Payload size shall depend upon the test configuration. Note 2: Cell ID shall depend upon the test configuration.					

A.7.3 TDD in CEModeA

Table A.7.3-1: MPDCCH Reference Channel for Cat-M1 TDD UEs in CEModeA

Parameter	Unit	Value	
MPDCCH Reference channel	-	R.14 TDD	R.15 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas	-	1	2
DCI Format	-	6-1A	6-1A
Transmission Type	-	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	4	4
Aggregation level	ECCE	16	16
Maximum number of repetitions	-	8	8
Frequency hopping	-	ON	ON
Number of narrowbands	-	2	2
MPDCCH Narrowband	-	1st	1st
Frequency HoppingOffset	narrowbands	7	7
MPDCCH start subframe	subframes	1	1
MPDCCH start symbol	symbols	2	2
Frequency hopping interval	subframes	10	10
Payload (without CRC)	Bits	Note 1	Note 1
Cell ID	-	Note 2	Note 2
Note 1: Payload size shall depend upon the test configuration. Note 2: Cell ID shall depend upon the test configuration.			

A.7.4 FDD in CEModeB

Table A.7.4-1: MPDCCH Reference Channel for Cat-M1 FDD UEs in CEModeB

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.18 FDD	R.19 FDD	R.26 FDD	R.27 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1B	6-1B	6-1B	6-1B
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	6	6	6	6
Aggregation level	ECCE	24	24	24	24
Maximum number of repetitions	-	128	128	128	128
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Payload (without CRC)	Bits	17	17	17	17
Cell ID	-	Note 1	Note 1	Note 1	Note 1
Note 1: Cell ID shall depend upon the test configuration.					

A.7.5 HD-FDD in CEModeB

Table A.7.5-1: MPDCCH Reference Channel for Cat-M1 HD-FDD UEs in CEModeB

Parameter	Unit	Value			
MPDCCH Reference channel	-	R.8 HD-FDD	R.9 HD-FDD	R.16 HD-FDD	R.17 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas	-	1	2	1	2
DCI Format	-	6-1B	6-1B	6-1B	6-1B
Transmission Type	-	Distributed	Distributed	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	6	6	6	6
Aggregation level	ECCE	24	24	24	24
Maximum number of repetitions	-	128	128	128	128
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands	-	2	2	2	2
MPDCCH Narrowband	-	1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
MPDCCH start subframe	subframes	1	1	1	1
MPDCCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Payload (without CRC)	Bits	17	17	17	17
Cell ID	-	Note 1	Note 1	Note 1	Note 1
Note 1: Cell ID shall depend upon the test configuration.					

A.7.6 TDD in CEModeB

Table A.7.6-1: MPDCCH Reference Channel for Cat-M1 TDD UEs in CEModeB

Parameter	Unit	Value	
MPDCCH Reference channel	-	R.16 TDD	R.17 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas	-	1	2
DCI Format	-	6-1B	6-1B
Transmission Type	-	Distributed	Distributed
Number of PRB pairs per M-PDCCH set	-	6	6
Aggregation level	ECCE	24	24
Maximum number of repetitions	-	128	128
Frequency hopping	-	ON	ON
Number of narrowbands	-	2	2
MPDCCH Narrowband	-	1^{st}	1^{st}
Frequency HoppingOffset	narrowbands	7	7
MPDCCH start subframe	subframes	1	1
MPDCCH start symbol	symbols	2	2
Frequency hopping interval	subframes	20	20
Payload (without CRC)	Bits	17	17
Cell ID	-	Note 1	Note 1
Note 1: Cell ID shall depend upon the test configuration.			

A.8 PDSCH Reference Channels for Cat-M1 UEs

A.8.1 FDD in CEModeA

Table A.8.1-1: PDSCH Reference Channel for Cat-M1 FDD in CEModeA

Parameter	Unit	Value			
PDSCH Reference channel		R.20 FDD	R.21 FDD	R.28 FDD	R.29 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas		1	2	1	2
Allocated resource blocks[Note1]	PRBs	2	2	2	2
Allocated subframes per Radio Frame	subframes	10	10	10	10
Modulation		QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3
Information Bit Payload					
Sub-Frames 0 ~ 9	Bits	32	32	32	32
Number of Code Blocks per Sub-Frame					
Sub-Frames 0 ~ 9		1	1	1	1
Maximum number of repetitions		16	16	16	16
Frequency hopping		ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2
PDSCH Narrowband		2nd	2nd	2nd	2nd
Frequency HoppingOffset	narrowbands	7	7	3	3
PDSCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.					

A.8.2 HD-FDD in CEModeA

Table A.8.2-1: PDSCH Reference Channel for Cat-M1 HD-FDD in CEModeA

Parameter	Unit	Value			
PDSCH Reference channel		R.10 HD-FDD	R.11 HD-FDD	R.18 HD-FDD	R.19 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas		1	2	1	2
Allocated resource blocks[Note1]	PRBs	2	2	2	2
Allocated subframes per Radio Frame	subframes	10	10	10	10
Modulation		QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3
Information Bit Payload					
Sub-Frames 0 ~ 9	Bits	32	32	32	32
Number of Code Blocks per Sub-Frame					
Sub-Frames 0 ~ 9		1	1	1	1
Maximum number of repetitions		16	16	16	16
Frequency hopping		ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2
PDSCH Narrowband		1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
PDSCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	4	4	4	4
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.					

A.8.3 TDD in CEModeA

Table A.8.3-1: PDSCH Reference Channel for Cat-M1 TDD in CEModeA

Parameter	Unit	Value	
PDSCH Reference channel		R.16 TDD	R.17 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks[Note1]	PRBs	2	2
Allocated subframes per Radio Frame		4	4
TDD Uplink-Downlink Configuration		0	0
TDD Special Subframe Configuration		6	6
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
All Sub-Frames except 1, 6 (TDD)	Bits	32	32
All Sub-Frames except 1, 6 (TDD DwPTS)	-	0	0
Number of Code Blocks per Sub-Frame		1	1
All Sub-Frames except 1, 6 (TDD)		1	1
All Sub-Frames except 1, 6 (TDD DwPTS)		0	0
Maximum number of repetitions		16	16
Frequency hopping		ON	ON
Number of narrowbands for frequency hopping		2	2
PDSCH Narrowband		2^{nd}	2^{nd}
Frequency HoppingOffset	narrowbands	7	7
PDSCH start symbol	symbols	2	2
Frequency hopping interval	subframes	10	10
Max. Throughput averaged over 1 frame	kbps	TBD	TBD
Cell ID		Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.			

A.8.4 FDD in CEModeB

Table A.8.4-1: PDSCH Reference Channel for Cat-M1 FDD in CEModeB

Parameter	Unit	Value			
PDSCH Reference channel		R.22 FDD	R.23 FDD	R.30 FDD	R.31 FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas		1	2	1	2
Allocated resource blocks[Note1]		2	2	2	2
Allocated subframes per Radio Frame	-	10	10	10	10
Modulation	-	QPSK	QPSK	QPSK	QPSK
Target coding rate	-	1/3	1/3	1/3	1/3
Information Bit Payload					
Sub-Frames 0 ~ 9	Bits	32	32	32	32
Number of Code Blocks per Sub-Frame					
Sub-Frames 0 ~ 9	-	1	1	1	1
Maximum number of repetitions	-	192	192	192	192
Frequency hopping	-	ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2
PDSCH Narrowband	-	2nd	2nd	2nd	2nd
Frequency HoppingOffset	narrowbands	7	7	3	3
PDSCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.					

A.8.5 HD-FDD in CEModeB

Table A.8.5-1: PDSCH Reference Channel for Cat-M1 HD-FDD in CEModeB

Parameter	Unit	Value			
PDSCH Reference channel		R.12 HD-FDD	R.13 HD-FDD	R.20 HD-FDD	R.21 HD-FDD
Carrier bandwidth	MHz	10	10	5	5
Number of transmitter antennas		1	2	1	2
Allocated resource blocks[Note1]	PRBs	2	2	2	2
Allocated subframes per Radio Frame	subframes	10	10	10	10
Modulation		QPSK	QPSK	QPSK	QPSK
Target coding rate		1/3	1/3	1/3	1/3
Information Bit Payload					
Sub-Frames 0 ~ 9	Bits	32	32	32	32
Number of Code Blocks per Sub-Frame					
Sub-Frames 0 ~ 9		1	1	1	1
Maximum number of repetitions		192	192	192	192
Frequency hopping		ON	ON	ON	ON
Number of narrowbands for frequency hopping	narrowbands	2	2	2	2
PDSCH Narrowband		1st	1st	1st	1st
Frequency HoppingOffset	narrowbands	7	7	3	3
PDSCH start symbol	symbols	2	2	2	2
Frequency hopping interval	subframes	8	8	8	8
Max. Throughput averaged over 1 frame	kbps	TBD	TBD	TBD	TBD
Cell ID		Note 2	Note 2	Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.					

A.8.6 TDD in CEModeA

Table A.8.6-1: PDSCH Reference Channel for Cat-M1 TDD in CEModeB

Parameter	Unit	Value	
PDSCH Reference channel		R.18 TDD	R.19 TDD
Carrier bandwidth	MHz	10	10
Number of transmitter antennas		1	2
Allocated resource blocks[Note1]	PRBs	2	2
Allocated subframes per Radio Frame		4	4
TDD Uplink-Downlink Configuration		0	0
TDD Special Subframe Configuration		6	6
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
All Sub-Frames except 1, 6 (TDD)	Bits	32	32
All Sub-Frames except 1, 6 (TDD DwPTS)	-	0	0
Number of Code Blocks per Sub-Frame		1	1
All Sub-Frames except 1, 6 (TDD)		1	1
All Sub-Frames except 1, 6 (TDD DwPTS)		0	0
Maximum number of repetitions		192	192
Frequency hopping		ON	ON
Number of narrowbands for frequency hopping		2	2
PDSCH Narrowband		2^{nd}	2^{nd}
Frequency HoppingOffset	narrowbands	7	7
PDSCH start symbol	symbols	2	2
Frequency hopping interval	subframes	20	20
Max. Throughput averaged over 1 frame	kbps	TBD	TBD
Cell ID		Note 2	Note 2
Note 1: Allocation is located in the middle of narrowband. Note 2: Cell ID shall depend upon the test configuration.			

A.9 Reference PRACH Configurations

Table A.9-1: PRACH configuration parameters

Parameter	Value			Comments
Reference configuration	PRACH_2CE	PRACH_3CE	PRACH_4CE	
Rsrp-ThresholdsPRACH	{-99} dBm	{-107, -99} dBm	{-107, -99, -92} dBm	As defined in TS36.331[5]
CE level0:	Configured	Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	FDD：4 TDD：53	FDD：4 TDD：53	FDD：4 TDD：53	See TS 36.211[9] section 5.7.1
numRepetitionPerPreambleAttempt:	1	1	1	Number of PRACH repetitions per attempt for each CE level, See TS 36.211[9]
prach-HoppingConfig:	off	off	off	Coverage level specific frequency hopping configuration for PRACH
CE level1:	Configured	Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	FDD：4 TDD：53	FDD：4 TDD：53	FDD：4 TDD：53	see TS 36.211[9] section 5.7.1
numRepetitionPerPreambleAttempt:	128	64	32	Number of PRACH repetitions per attempt for each CE level, See TS 36.211[9]
prach-HoppingConfig:	off	off	off	Coverage level specific frequency hopping configuration for PRACH
CE level2:	Not Configured	Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	-	FDD：4 TDD：53	FDD：4 TDD：53	see TS 36.211[9] section 5.7.1
numRepetitionPerPreambleAttempt:	-	128	64	Number of PRACH repetitions per attempt for each CE level, See TS 36.211[9]
prach-HoppingConfig:	-	off	off	Coverage level specific frequency hopping configuration for PRACH
CE level3:	Not Configured	Not Configured	Configured	Up to 4 CE levels, each corresponding to a PRACH configuration
Prach Configuration Index:	-	-	FDD：4 TDD：53	see TS 36.211[9] section 5.7.1
numRepetitionPerPreambleAttempt:	-	-	128	Number of PRACH repetitions per attempt for each CE level, See TS 36.211[9]
prach-HoppingConfig:	-	-	off	Coverage level specific frequency hopping configuration for PRACH

A.10 General configuration for NB-IoT

This clause defines the configuration for category NB1 UEs used in NB-IoT RRM tests.

A.10.1 NPDCCH Reference Channel for UE category NB1

A.10.1.1 HD-FDD in-band operation

Table A.10.1.1-1: NPDCCH Reference Channel for UE category NB1 for in-band operation

Parameter	Unit	Value	
NPDCCH Reference channel	-	R.26 HD-FDD	R.27 HD-FDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks Note1	PRB	1	1
Number of transmitter antennas	-	1	2
DCI Format	-	N1	N1
Aggregation level	NCCE	2	2
Maximum number of repetitions	-	Note 2	Note 2
NPDCCH start symbol	symbols	3	3
Payload (without CRC)	Bits	Note 3	Note 3
Cell ID	-	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.			

A.10.1.2 HD-FDD standalone operation

Table A.10.1.2-1: NPDCCH Reference Channel for UE category NB1 for standalone operation

Parameter	Unit	Value	
NPDCCH Reference channel	-	R.30 HD-FDD	R.31 HD-FDD
Channel bandwidth	KHz	200	200
Number of transmitter antennas	-	1	2
DCI Format	-	N1	N1
Aggregation level	NCCE	2	2
Maximum number of repetitions	-	Note 2	Note 2
Payload (without CRC)	Bits	Note 3	Note 3
Cell ID	-	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.			

A.10.1.3 HD-FDD guard band operation

Table A.10.1.3-1: NPDCCH Reference Channel for UE category NB1 for guard band operation

Parameter	Unit	Value	
NPDCCH Reference channel	-	R.34 HD-FDD	R.35 HD-FDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks for NB-ioT Note1	PRB	1	1
Number of transmitter antennas	-	1	2
DCI Format	-	N1	N1
Aggregation level	NCCE	2	2
Maximum number of repetitions	-	Note 2	Note 2
Payload (without CRC)	Bits	Note 3	Note 3
Cell ID	-	Note 4	Note 4
Note 1: Allocation is located in the middle of narrowband. Note 2: Maximum number of repetitions shall depend upon the test configuration. Note 3: Payload size shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration.			

A.10.2 NPDSCH Reference Channel for UE category NB1

A.10.2.1 HD-FDD in-band operation

Table A.10.2.1-1: NPDSCH Reference Channel for UE category NB1 for in-band operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.14 HD-FDD	R.15 HD-FDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks Note1	PRB	1	1
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	40 Note 2	40 Note 2
For Sub-Frame 4, 9	Bits	Note 3	Note 3
For Sub-Frame 0, 5	Bits	0	0
Number of Code Blocks per Sub-Frame			
For Sub-Frame 1, 2, 3, 6, 7, 8		1 Note 4	1 Note 4
For Sub-Frame 4, 9		Note 5	Note 5
For Sub-Frame 0, 5		0	0
Maximum number of repetitions	-	Note 6	Note 6
NPDCCH start symbol	symbols	3	3
Cell ID	-	Note 7	Note 7

Note 1: Shall depend upon the NPDSCH scheduling
Note 2: only apply for subframes scheduled with NPDSCH.
Note 3: 40 for subframes scheduled with NPDSCH when $n_f \bmod 2 \neq 0$. Otherwise 0.
Note 4: only apply for subframes scheduled with NPDSCH.
Note 5: 1 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0.
Note 6: Maximum number of repetitions shall depend upon the test configuration.
Note 7: Cell ID shall depend upon the test configuration.

A.10.2.2 HD-FDD standalone operation

Table A.10.2.2-1: NPDSCH Reference Channel for UE category NB1 for standalone operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.18 HD-FDD	R.19 HD-FDD
Channel bandwidth	KHz	200	200
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	72[Note 2]	72[Note 2]
For Sub-Frame 4, 9	Bits	Note 3	Note 3
For Sub-Frame 0, 5	Bits	0	0
Number of Code Blocks per Sub-Frame			
For Sub-Frame 1, 2, 3, 6, 7, 8		1[Note 4]	1[Note 4]
For Sub-Frame 4, 9		Note 5	Note 5
For Sub-Frame 0, 5		0	0
Maximum number of repetitions	-	Note 6	Note 6
Cell ID	-	Note 7	Note 7
Note 1: Shall depend upon the NPDSCH scheduling. Note 2: only apply for subframes scheduled with NPDSCH Note 3: 72 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0. Note 4: only apply for subframes scheduled with NPDSCH. Note 5: 1 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0. Note 6: Maximum number of repetitions shall depend upon the test configuration. Note 7: Cell ID shall depend upon the test configuration.			

A.10.2.3 HD-FDD guard band operation

Table A.10.2.3-1: NPDSCH Reference Channel for UE category NB1 for guard band operation

Parameter	Unit	Value	
NPDSCH Reference channel	-	R.22 HD-FDD	R.23 HD-FDD
LTE Carrier bandwidth	MHz	10	10
Allocated resource blocks for NB-IoT[Note1]	PRB	1	1
Number of transmitter antennas	-	1	2
Allocated subframes per Radio Frame	subframes	Note 1	Note 1
Modulation		QPSK	QPSK
Target coding rate		1/3	1/3
Information Bit Payload			
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	72[Note 2]	72[Note 2]
For Sub-Frame 4, 9	Bits	Note 3	Note 3
For Sub-Frame 0, 5	Bits	0	0
Number of Code Blocks per Sub-Frame			
For Sub-Frame 1, 2, 3, 6, 7, 8		1[Note 4]	1[Note 4]
For Sub-Frame 4, 9		Note 5	Note 5
For Sub-Frame 0, 5		0	0
Maximum number of repetitions	-	Note 6	Note 6
Cell ID	-	Note 7	Note 7
Note 1: Shall depend upon the NPDSCH scheduling. Note 2: only apply for subframes scheduled with NPDSCH. Note 3: 72 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0. Note 4: only apply for subframes scheduled with NPDSCH. Note 5: 1 for subframes scheduled with NPDSCH when mod 2 ≠ 0. Otherwise 0. Note 6: Maximum number of repetitions shall depend upon the test configuration. Note 7: Cell ID shall depend upon the test configuration.			

A.10.3 Reference NPRACH Configurations

Table A.10.3-1 defines the reference NB-IoT PRACH configurations for a NB-IoT RRM test case where the UE is required to transmit NPRACH during the testing procedure, but the testing purpose of the RRM test case does not include testing NPRACH performance.

Table A.10.3-1: NPRACH.R-1: Reference NPRACH Configuration

Field	Value			Comment
Parameters not per NPRACH coverage level				
rsrp-ThresholdsPrach	{rsrp1, rsrp2}			The values of NPRACH RSRP thresholds for will be set according the requirement of individual test cases
nprach-CP-Length	us66dot7			NPRACH format 0
Parameters per NPRACH coverage Level				
CE Level	***Level 0***	***Level 1***	***Level 2***	**Valid values as defined in TS 36.331**
nprach-Periodicity	ms40	ms40	ms40	{ms40, ms80, ms160, ms240, ms320, ms640, ms1280, ms2560}
nprach-StartTime	ms8	ms8	ms8	{ms8, ms16, ms32, ms64, ms128, ms256, ms512, ms1024}
nprach-SubcarrierOffset	n0	n0	n0	{n0, n12, n24, n36, n2, n18, n34}
nprach-NumSubcarriers	n12	n12	n12	{n12, n24, n36, n48}
nprach-SubcarrierMSG3-RangeStart	{one}	{one}	{one}	{zero, oneThird, twoThird, one}
maxNumPreambleAttemptCE	n3	n5	n7	{n3, n4, n5, n6, n7, n8, n10}
numRepetitionsPerPreambleAttempt	n1	n8	n32	{n1, n2, n4, n8, n16, n32, n64, n128}
npdcch-NumRepetitions-RA	r1	r8	n32	{r1, r2, r4, r8, r16, r32, r64, r128, r256, r512, r1024, r2048}
npdcch-StartSF-CSS-RA	v2	v2	v2	{v1dot5, v2, v4, v8, v16, v32, v48, v64}
npdcch-Offset-RA	zero	zero	zero	{zero, oneEighth, oneFourth, threeEighth}
Note 1: See Clause 6.3.2 in TS 36.331 for further information on the parameters in this table.				

Annex B (normative): Propagation Conditions

B.0 No interference

See TS 36.521-1[10] Annex B.0.

B.1 Static propagation condition

See TS 36.521-1[10] Annex B.1 and B.1.1

B.2 Multi-path fading Propagation Conditions

See TS 36.521-1[10] Annex B.2,B.2.1 and B.2.2

Annex C (normative): Downlink Physical Channels

C.0 Downlink signal

See TS 36.521-1[10] Annex C.0.

C.1 General

See TS 36.521-1[10] Annex C.1.

For CA tests with 1 UL, no PHICH resources are assigned to the DUT in the SCell. In such case PHICH of SCell is entirely part of OCNG pattern used.

C.2 Set-up

See TS 36.521-1[10] Annex C.2.

C.3 Test specific scenarios

C.3.1 ABS Transmission Configurations

C.3.1.1 Non-MBSFN ABS Transmission Configurations

C.3.1.1.1 Non-MBSFN ABS Transmission, 1x2 antenna with PBCH

Table C.3.1.1.1-1: Transmission configuration with non-MBSFN ABS, 1x2 with PBCH

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	0	0
	PBCH_RB	0	0
PSS	PSS_RA	0	0
SSS	SSS_RA	0	0
PCFICH	PCFICH_RB	0	0 (Note 1)
PHICH	PHICH_RA	0	-Inf
	PHICH_RB	0	-Inf
PDCCH	PDCCH_RA	0	0 (Note 1)
	PDCCH_RB	0	0 (Note 1)
PDSCH	PDSCH_RA	0	0 (Note 1)
	PDSCH_RB	0	0 (Note 1)
OCNG	OCNG_RA	0	-Inf
	OCNG_RB	0	-Inf
NOTE 1: Only used for SIB1, otherwise EPRE is –Inf NOTE 2: 1x2 antenna configuration is assumed			

C.3.1.1.2 Non-MBSFN ABS Transmission, 2x2 antenna without PBCH

Table C.3.1.1.2-1: Transmission configuration #1 with non-MBSFN ABS, 2x2 without PBCH

Physical Channels and Signals	Parameters	EPRE [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	-Inf
	PBCH_RB	-3	-Inf
PSS	PSS_RA	-3	-3
SSS	SSS_RA	-3	-3
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	1	-Inf
	PDCCH_RB	1	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

Table C.3.1.1.2-2: Transmission configuration #2 with non-MBSFN ABS, 2x2 without PBCH

Physical Channels and Signals	Parameters	EPRE [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	-Inf
	PBCH_RB	-3	-Inf
PSS	PSS_RA	-3	-3
SSS	SSS_RA	-3	-3
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	-3	-Inf
	PDCCH_RB	-3	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

C.3.1.2 MBSFN ABS Transmission Configurations

C.3.1.2.1 MBSFN ABS Transmission, 1x2 antenna

Table C.3.1.2.1-1: Transmission configuration with MBSFN ABS, 1x2

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	0	N/A
	PBCH_RB	0	N/A
PSS	PSS_RA	0	N/A
SSS	SSS_RA	0	N/A
PCFICH	PCFICH_RB	0	-Inf
PHICH	PHICH_RA	0	-Inf
	PHICH_RB	0	-Inf
PDCCH	PDCCH_RA	0	-Inf
	PDCCH_RB	0	-Inf
PDSCH	PDSCH_RA	0	-Inf
	PDSCH_RB	0	-Inf
PMCH	PMCH_RA	0	-Inf
	PMCH_RB	0	-Inf
OCNG	OCNG_RA	0	-Inf
	OCNG_RB	0	-Inf
NOTE: 1x2 antenna configuration is assumed			

C.3.1.2.2 MBSFN ABS Transmission, 2x2 antenna

Table C.3.1.2.2-1: Transmission configuration #1 with MBSFN ABS, 2x2

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	N/A
	PBCH_RB	-3	N/A
PSS	PSS_RA	-3	N/A
SSS	SSS_RA	-3	N/A
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	1	-Inf
	PDCCH_RB	1	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
PMCH	PMCH_RA	-3	-Inf
	PMCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

Table C.3.1.2.2-2: Transmission configuration # 2 with MBSFN ABS, 2x2

Physical Channels and Signals	Parameters	EPRE, [dB]	
		Non-ABS	ABS
PBCH	PBCH_RA	-3	N/A
	PBCH_RB	-3	N/A
PSS	PSS_RA	-3	N/A
SSS	SSS_RA	-3	N/A
PCFICH	PCFICH_RB	1	-Inf
PHICH	PHICH_RA	-3	-Inf
	PHICH_RB	-3	-Inf
PDCCH	PDCCH_RA	-3	-Inf
	PDCCH_RB	-3	-Inf
PDSCH	PDSCH_RA	-3	-Inf
	PDSCH_RB	-3	-Inf
PMCH	PMCH_RA	-3	-Inf
	PMCH_RB	-3	-Inf
OCNG	OCNG_RA	-3	-Inf
	OCNG_RB	-3	-Inf
NOTE: 2x2 antenna configuration is assumed			

C.3.2 Impact of Reference Sensitivity Degradation with Carrier Aggregation on Test Cases

C.3.2.1 Impact of Reference Sensitivity Degradation due to Insertion Loss

For a UE supporting inter-band carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IB,c}$>0 dB as defined in TS 36.101 [2], 7.3.1-1A, there is no adjustment of test parameters in the tests specified in TS 36.133 when $\Delta R_{IB,c} \leq 1$ dB.

C.3.3 Carrier Aggregation Test Cases with Different Channel Bandwidth Combinations

C.3.3.1 Introduction

In clauses 8 and 9 carrier aggregation test cases may be defined with different channel bandwidth combinations to verify the same RRM requirement.

If multiple carrier aggregation test cases with different channel bandwidth combinations are defined to verify the same RRM requirement that is channel bandwidth independent, then the UE needs to be tested only with one bandwidth combination out of the bandwidth combination sets supported by that UE.

C.3.4 Proximity-based Services

C.3.4.1 Introduction

This clause also defines the principle and the reference configurations that are applicable to test cases verifying RRM core requirements for ProSe Direct Discovery and ProSe Direct Communication.

C.3.4.2 Reference DRX configurations for ProSe tests

Table C.3.4.2-1: Reference DRX Configurations

Parameter	Value
Reference configuration	DRX_P1
onDurationTimer	psf1
drx-InactivityTimer	psf1
drx-RetransmissionTimer	psf1
longDRX-CycleStartOffset	sf320, 0
shortDRX	Disabled
Note: For further information see clause 6.3.2 in TS 36.331.	

C.3.4.3 Test Cases with Different Channel Bandwidths

C.3.4.3.1 Introduction

This clause defines a principle which is applicable to test cases verifying ProSe RRM requirements with different channel bandwidths.

C.3.4.3.2 Principle of testing

Some ProSe test cases are defined for different channel bandwidths to verify the same RRM requirement.

If test cases with different channel bandwidth are defined to verify the same RRM requirement then the UE is required to pass the test cases only with one of the channel bandwidths.

C.3.5 Listen before talk model

C.3.5.1 Introduction

In some RRM test cases for FS3, a listen before talk (LBT) model is specified. The intention of the LBT model is to emulate using test equipment the behaviour of an FS3 eNB which performs channel measurement to check that the channel is clear prior to performing downlink transmission.

C.3.5.2 Definition

Prior to each DMTC window, the test equipment shall determine whether to transmit a discovery reference signal (DRS) during the DMTC window with probability P=[0.75]. In many cases the test requirement depends on the number of configured discovery signal occasions which are not available during the test, so the test equipment shall track how many DRS are not transmitted during the test period. If the test equipment determines that it shall transmit a DRS, then the timing of the DRS transmission within the DMTC window is randomly selected from the set of possible DRS transmission signal timings, such that there is an equal probability of any valid DRS timing.

For non DRS downlink transmission bursts, if transmission occurred in the previous subframe, transmission is muted for a duration of one subframe. Additionally, if the start time of the candidate transmission burst is within [8] subframes of the start of the DMTC window, transmission is not performed. Otherwise

The length of the transmission burst in subframes is defined as N. The burst transmission format is determined according to the steps below:

1. Select N randomly from a given set of the number of subframes S_1={1,3,5,8} with equal probability as the total length of burst transmission format.

2. A uniform random variable from [0, 1] is generated. If the random variable is less than P=[0.75], a burst of N fully occupied subframes is transmitted. Otherwise, the burst transmission is muted and the muting duration is the same as the number N of subframes for determined burst format.

Annex D (normative): OFDMA Channel Noise Generator (OCNG)

D.1 OCNG Patterns for FDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test) and/or allocations used for MBSFN. The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols with and without reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a constant transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. The number of PDCCH OFDM symbols in the non-MBSFN subframes is the same as specified in the RMC used in the test. The number of PDCCH OFDM symbols in the MBSFN subframes is the maximal allowed according to 3GPP TS 36.213 [8]. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given respectively by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

For subframes configured as PRS subframes the PDSCH allocation defined in the OCNG pattern does not apply.

For subframes configured as ABS subframes the PDSCH and PMCH allocation defined in the OCNG pattern does not apply.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes not configured for MBSFN. For this purpose the number of the RB-s allocated with PDSCH defined in the OCNG pattern can be reduced as necessary.

D.1.1 OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		
0 - 12	0	0	0	N/A	Note 1	N/A
37 - 49	0	0	0	N/A		
0-49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz

Table D.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 - 3, 6 - 8		
0 - 49	0	0	0	N/A	Note 1	N/A
0 - 49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.3 OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.1.3-1: OP.3 FDD: OCNG FDD Pattern 3

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		
0 - 1	0	0	0	N/A	Note 1	N/A
4 - 5	0	0	0	N/A		
0 - 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.1.4-1: OP.4 FDD: OCNG FDD Pattern 4

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 - 3, 6 - 8		
0 - 5	0	0	0	N/A	Note 1	N/A
0 - 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)

Table D.1.5-1: OP.5 FDD: OCNG FDD Pattern 5

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 12	0	0	0	N/A	Note 2
37 - 49	0	0	0	N/A	
0 - 49	N/A	N/A	N/A	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.6 OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN)

Table D.1.6-1: OP.6 FDD: OCNG FDD Pattern 6

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)

Table D.1.7-1: OP.7 FDD: OCNG FDD Pattern 7

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 5	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.8 OCNG FDD pattern 8: outer resource blocks allocation in 10 MHz for MBSFN ABS

Table D.1.8-1: OP.8 FDD: OCNG FDD Pattern 8

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4,9	(1-3, 6-8)[Note4]	
0 – 12	0	0	0	N/A	Note 2
37 – 49	0	0	0	N/A	
0 – 49	N/A	N/A	N/A	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
Note 4: The subframe(s) configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
N/A: Not Applicable

D.1.9 OCNG FDD pattern 9: full bandwidth allocation in 10 MHz for MBSFN ABS

Table D.1.9-1: OP.9 FDD: OCNG FDD Pattern 9

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	(1-3, 6-8)[Note4]	
0 – 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
Note 4: The subframe(s) configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
N/A: Not Applicable

D.1.10 OCNG FDD pattern 10: outer resource blocks allocation in 10 MHz with user data in every SF (without MBSFN)

Table D.1.10-1: OP.10 FDD: OCNG FDD Pattern 10

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 12	0	0	0	0	Note 2
37 - 49	0	0	0	0	
Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes. Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH. Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213. N/A: Not Applicable					

D.1.11 OCNG FDD pattern 11: outer resource blocks allocation in 20 MHz

Table D.1.11-1: OP.11 FDD: OCNG FDD Pattern 11

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		

0 – 37	0	0	0	N/A	Note 1	N/A
62 – 99	0	0	0	N/A		
0-99	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.12 OCNG FDD pattern 12: full bandwidth allocation in 20 MHz

Table D.1.12-1: OP.12 FDD: OCNG FDD Pattern 12

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 – 3, 6 – 8		
0 – 99	0	0	0	N/A	Note 1	N/A
0 – 99	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.13 OCNG FDD pattern 13: outer resource blocks allocation in 20 MHz (without MBSFN)

Table D.1.13-1: OP.13 FDD: OCNG FDD Pattern 13

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4,9	1-3, 6-8	
0 – 37	0	0	0	N/A	Note 2
62 – 99	0	0	0	N/A	
0 – 99	N/A	N/A	N/A	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.14 OCNG FDD pattern 14: full bandwidth allocation in 20 MHz (without MBSFN)

Table D.1.14-1: OP.14 FDD: OCNG FDD Pattern 14

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 – 3, 6 – 8	
0 – 99	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.15 OCNG FDD pattern 15: outer resource blocks allocation in 5 MHz

Table D.1.15-1: OP.15 FDD: OCNG FDD Pattern 15

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data	PMCH Data
	Subframe					
	0	5	4,9	1-3, 6-8		

0 – 6	0	0	0	N/A	Note 1	N/A
18 – 24	0	0	0	N/A		
0-24	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

D.1.16 OCNG FDD pattern 16: full bandwidth allocation in 5 MHz

Table D.1.16-1: OP.16 FDD: OCNG FDD Pattern 16

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 – 3, 6 – 8		
0 – 24	0	0	0	N/A	Note 1	N/A
0 – 24	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

D.1.17 OCNG FDD pattern 17: outer resource blocks allocation in 20 MHz with user data in every subframe (without MBSFN)

Table D.1.17-1: OP.17 FDD: OCNG FDD Pattern 17

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 37	0	0	0	0	Note 2
62 - 99	0	0	0	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable.

D.1.18 OCNG FDD pattern 18: outer resource blocks allocation in 5 MHz (without MBSFN)

Table D.1.18-1: OP.18 FDD: OCNG FDD Pattern 18

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4,9	1-3, 6-8	
0 – 6	0	0	0	N/A	Note 2
18 – 24	0	0	0	N/A	
0 – 24	N/A	N/A	N/A	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable

D.1.19 OCNG FDD pattern 19: full bandwidth allocation in 5 MHz (without MBSFN)

Table D.1.19-1: OP.19 FDD: OCNG FDD Pattern 19

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 – 3, 6 – 8	
0 – 24	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable

D.1.20 OCNG FDD pattern 20: outer resource blocks allocation in 5 MHz with user data in every subframe (without MBSFN)

Table D.1.20-1: OP.20 FDD: OCNG FDD Pattern 20

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 6	0	0	0	0	Note 2
18 - 24	0	0	0	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
N/A: Not Applicable.

D.1.21 OCNG FDD pattern 21: Generic resource blocks allocation (without MBSFN)

Table D.1.21-1: OP.21 FDD: OCNG FDD Pattern 21

OCNG Pattern Name	Bandwidth (MHz)	Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
			Subframe				
			0	5	4, 9	1 – 3, 6 – 8	
OP.21 FDD	10	0 – 49[Note 1,2]	0	0	0	0	Note 3
Note 1: The OCNG pattern is used only for a serving cell of the UE under test. Note 2: The OCNG allocation applied to all downlink physical resource blocks (PRBs) except the REs that are allocated for the PDSCH for the UE under test. Note 3: OCNG PRBs are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH. Note 4: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.							

D.2 OCNG Patterns for TDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test). The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols with and without reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. The number of PDCCH OFDM symbols in the non-MBSFN subframes is the same as specified in the RMC used in the test. The number of PDCCH OFDM symbols in the MBSFN subframes is the maximal allowed according to 3GPP TS 36.213 [8]. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given respectively by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

For subframes configured as PRS subframes the PDSCH allocation defined in the OCNG pattern does not apply.

For subframes configured as ABS subframes the PDSCH and PMCH allocation defined in the OCNG pattern does not apply.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes not configured for MBSFN. For this purpose the number of the RB-s allocated with PDSCH defined in the OCNG pattern can be reduced as necessary.

D.2.1 OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

<table>
<tr><th rowspan="3">Allocation
n_{PRB}</th><th colspan="4">Relative power level γ_{PRB} [dB]</th><th rowspan="3">PDSCH Data</th></tr>
<tr><th colspan="4">Subframe (Note 1)</th></tr>
<tr><th>0</th><th>5</th><th>3, 4, 8, 9 and 6 (as normal subframe) Note 3</th><th>1 and 6 (as special subframe) Note 3</th></tr>
<tr><td>0 - 12</td><td>0</td><td>0</td><td>0</td><td>0</td><td rowspan="2">Note 2</td></tr>
<tr><td>37 - 49</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td colspan="6">Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [9]. The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.</td></tr>
</table>

D.2.2 OCNG TDD pattern 2: full bandwidth allocation in 10 MHz

Table D.2.2-1: OP.2 TDD: OCNG TDD Pattern 2 for 5ms downlink-to-uplink switch-point periodicity

<table>
<tr><th rowspan="3">Allocation
n_{PRB}</th><th colspan="4">Relative power level γ_{PRB} [dB]</th><th rowspan="3">PDSCH Data</th></tr>
<tr><th colspan="4">Subframe (Note 1)</th></tr>
<tr><th>0</th><th>5</th><th>3 , 4, 8, 9 and 6 (as normal subframe) Note 3</th><th>1 and 6 (as special subframe) Note 3</th></tr>
<tr><td>0 - 49</td><td>0</td><td>0</td><td>0</td><td>0</td><td>Note 2</td></tr>
<tr><td colspan="6">Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211[9]. The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.</td></tr>
</table>

D.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table D.2.3-1: OP.3 TDD: OCNG TDD Pattern 3 for 5 ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 1	0	0	0	0	Note 2
4 - 5	0	0	0	0	

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [9].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.4 OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz

Table D.2.4-1: OP.4 TDD: OCNG TDD Pattern 4 for 5 ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 5	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [9].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.5 OCNG TDD pattern 5: outer resource blocks allocation in 10 MHz for MBSFN ABS

Table D.2.5-1: OP.5 TDD: OCNG TDD Pattern 5 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 12	0	0	0	Table D.2.5-2	Note 2
37 – 49	0	0	0		

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in TS 36.211 [16]. Any of the subframes 3, 4, 8 and 9 configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Table D.2.5-2: OP.5 TDD: OCNG TDD Pattern 5 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 12	N	0		0		0		0		0		0		0		0		0	
37 – 49	N	0		0		0		0		0		0		0		0		0	
Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].																			

D.2.6 OCNG TDD pattern 6: full bandwidth allocation in 10 MHz for MBSFN ABS

Table D.2.6-1: OP.6 TDD: OCNG TDD Pattern 6 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 49	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16]. Any of the subframes 3, 4, 8 and 9 configured as MBSFN ABS in a test shall not contain any PMCH data and shall contain CRS only in the first symbol of the first time slot. The subframe(s) configured as MBSFN ABS depend upon the MBSFN ABS pattern used in the test.
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

D.2.7 OCNG TDD pattern 7: outer resource blocks allocation in 20 MHz

Table D.2.7-1: OP.7 TDD: OCNG TDD Pattern 7 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	

0 – 37	0	0	0	Table D.2.7-2	Note 2
62 – 99	0	0	0		

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table D.2.7-2: OP.7 TDD: OCNG TDD Pattern 7 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 37	N	0		0		0		0		0		0		0		0		0	
62 – 99	N	0		0		0		0		0		0		0		0		0	

Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].

D.2.8 OCNG TDD pattern 8: full bandwidth allocation in 20 MHz

Table D.2.8-1: OP.8 TDD: OCNG TDD Pattern 8 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe)Note 3	1 and 6 (as special subframe) Note 3	
0 – 99	0	0	0	0	Note 2

Note 1: The allocation of any PDSCH with or without SIB1 applies only to the subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.9 OCNG TDD pattern 9: outer resource blocks allocation in 5 MHz

Table D.2.9-1: OP.9 TDD: OCNG TDD Pattern 9 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 – 6	0	0	0	Table A.3.2.1.7-2	Note 2
18 – 24	0	0	0		

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table D.2.9-2: OP.9 TDD: OCNG TDD Pattern 9 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 6	N	0		0		0		0		0		0		0		0		0	
18 – 24	N	0		0		0		0		0		0		0		0		0	

Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].

D.2.10 OCNG TDD pattern 10: full bandwidth allocation in 5 MHz

Table D.2.10-1: OP.10 TDD: OCNG TDD Pattern 10 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe)Note 3	1 and 6 (as special subframe) Note 3	
0 – 24	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.11 OCNG TDD pattern 11: Generic resource blocks allocation (without MBSFN)

Table D.2.11-1: OP.11 TDD: OCNG TDD Pattern 11

OCNG Pattern Name	Bandwidth (MHz)	Allocation n_{PRB}	Relative power level γ_{PRB} [dB]				PDSCH Data
			Subframe				
			0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 5	1 and 6 (as special subframe) Note 5	
OP.11 TDD	10	0 – 49Note 1,2	0	0	0	0	Note 3

Note 1: The OCNG pattern is used only for a serving cell of the UE under test.
Note 2: The OCNG allocation applied to all downlink physical resource blocks (PRBs) except the REs that are allocated for the PDSCH for the UE under test.
Note 3: OCNG PRBs are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 4: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.
Note 5: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in TS 36.211 [16]

D.3 OCNG Patterns for Narrowband IoT

The following Narrowband OCNG patterns (NOCNG) are used for modelling allocations to UEs not under test in a Narrowband IoT cell. Depending on scenario, allocations may be for UEs of category NB1only, or for UEs of category NB1 as well as of other categories. The former is applicable to guard-band and stand-alone deployments of Narrowband IoT, whereas the latter is applicable to in-band deployment. In order to allow different power levels for the LTE cell and the Narrowband IoT cell, a distinction is made between OCNG and NOCNG where the latter is used for category NB1 UEs and the former is used for other UE categories.

OCNG in the LTE cell is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH-to-RS EPRE ratio in OFDM symbols with and without LTE cell-specific reference symbols, respectively. The relative power, which is used for modelling boosting per virtual LTE UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual LTE UE.

Moreover in each test case NOCNG is expressed by parameters NOCNG_RA and NOCNG_RB which together with a relative power level (γ) specifies the <channel>-to-RS EPRE ratio in OFDM symbols with and without Narrowband reference symbols (NB-RS), respectively. The relative power, which is used for modelling boosting per virtual UE category NB1 allocation, is expressed by:

$$\gamma_k = <channel>_k\_RA / NOCNG\_RA = <channel>_k\_RB / NOCNG\_RB,$$

where γ_k denotes the relative power level of the *k:th* virtual NB-IoT UE, and channel may be either of NPDCCH and NPDSCH.

The parameter settings of OCNG_RA, OCNG_RB, NOCNG_RA, NOCNG_RB and the set of relative power levels γ are chosen such that when also taking allocations to the UE category NB1 under test into account, as given by a NPDCCH and NPDSCH reference channels, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

D.3.1 Narrowband IoT OCNG FDD pattern 1: In-band NB-IoT in 10 MHz EUTRAN cell

Table D.3.1-1: NOP.1 FDD: OCNG FDD Pattern 1

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**PDSCH Data**	**NPDCCH and NPDSCH Data**
	Subframe				
	0, 4	5, 9	1-3, 6-8		
0 – 29, 35 – 49	0	0	0	Note 1	N/A
30 – 34	0 (Note 3)	0 (Note 3)	N/A	N/A	Note 2
30 – 34	N/A	N/A	0	Note 1	N/A

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS, and NPBCH in anchor cell (n_{PRB} = 30).

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

N/A: Not Applicable

D.3.2 Narrowband IoT OCNG FDD pattern 2: guard band NB-IoT in 10 MHz EUTRAN cell

Table D.3.2-1: NOP.2 FDD: OCNG FDD Pattern 2

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**PDSCH Data**	**NPDCCH and NPDSCH Data**
	Subframe				
	0, 4	5, 9	1-3, 6-8		

0-49	0	0	0	Note 1	N/A
50-52	0	0 (Note 3)	0	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of PDSCH.
If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 3: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and PBCH in anchor cell (n_{PRB} = 50).

Note 4: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over OCNG and NOCNG.

N/A: Not Applicable

D.3.3 Narrowband IoT OCNG FDD pattern 3: standalone NB-IoT

Table D.3.3-1: NOP.3 FDD: OCNG FDD Pattern 3

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**			**NPDCCH and NPDSCH Data**
	Subframe			
	0, 4	5, 9	1-3, 6-8	
0 – 5	0 (Note 1)	0 (Note 1)	0	Note 2

Note 1: This physical resource block is assigned to a virtual UE for transmission of NPDCCH or NPDSCH; the data transmitted over the NOCNG NPDCCH or NPDSCH shall be uncorrelated QPSK modulated pseudo random data. The parameter γ_{PRB} is used to scale the power of NPDCCH and NPDSCH.
If two transmit antennas with NBRS are used in the test, the NPDCCH and NPDSCH parts of NOCNG shall be transmitted to the virtual users by both transmit antennas with NBRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the NPDCCH and NPDSCH parts of NOCNG is equal between both the transmit antennas with NBRS used in the test. The antenna transmission modes are specified in clause 7.1 in TS 36.213.

Note 2: Value of γ_{PRB} is applicable to PRBs not used for transmission of NPSS, NSSS and PBCH in anchor cell (n_{PRB} = 0).

Note 3: SI transmissions, and NPDCCH and NPDSCH for the UE under test, have precedence over NOCNG.

Annex E (normative): Cell configuration mapping

The cells used in TS 36.521-3 do not correspond to the cells defined in TS 36.508 [7] section 4.4.2. Tables E-1, E-2 and E-3 describes the mapping between cells described in TS 36.521-3 and those defined in TS 36.508 [7]. Table E-4 describe the mapping between Ncells described in TS 36.521-3 and those defined in TS 36.508 [7] For each test case the cells as defined in TS 36.508 [7] section 4.4.2 and section 8.1.4.2 are listed in one row. The test case shall apply the RF parameters as defined in TS 36.521-3 according to the column heading.

NOTE: For example if the second cell in a test case is an inter-frequency cell then Cell3 from TS 36.508 [7] section 4.4.2 is used with the radio parameters as defined for Cell2 in TS 36.521-3.

Table E-1: Cell configuration mapping for RRM testing

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
4.2.1	RRC IDLE / E-UTRAN Cell Reselection / FDD - FDD cell re-selection intra frequency case	Cell1	Cell11		
4.2.2	RRC IDLE / E-UTRAN Cell Reselection / TDD - TDD cell re-selection intra frequency case	Cell1	Cell11		
4.2.3	RRC IDLE / E-UTRAN Cell Reselection / FDD - FDD cell re-selection inter frequency case	Cell6	Cell23		
4.2.4	RRC IDLE / E-UTRAN Cell Reselection / FDD - TDD cell re-selection inter frequency case	Cell1	Cell31	Dual mode in single PLMN	
4.2.5	RRC IDLE / E-UTRAN Cell Reselection / TDD - FDD cell re-selection inter frequency case	Cell31	Cell1		
4.2.6	RRC IDLE / E-UTRAN Cell Reselection / TDD - TDD cell re-selection inter frequency case	Cell6	Cell23		
4.2.7	RRC IDLE / E-UTRAN Cell Reselection / FDD – FDD Inter frequency case in the existence of non-allowed CSG cell	Cell23	Cell6	Cell3	
4.2.8	RRC IDLE / E-UTRAN Cell Reselection / TDD – TDD Inter frequency case in the existence of non-allowed CSG cell	Cell23	Cell6	Cell3	
4.2.9	RRC IDLE / E-UTRAN Cell Reselection / E-UTRAN FDD-FDD intra-frequency Cell Re-selection case for 5MHz Bandwidth	Cell1	Cell11		
4.2.12	E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Cell1	Cell11		
4.2.13	E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Cell1	Cell11		
4.2.14	E-UTRAN TDD – TDD Intra frequency case for Cat-M1 UE in normal coverage	Cell1	Cell11		
4.2.15	E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Cell1	Cell11		
4.2.16	E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Cell1	Cell11		
4.2.17	E-UTRAN TDD – TDD Intra frequency case for Cat-M1 UE in enhanced coverage	Cell1	Cell11		
4.2.18	HD – FDD Intra frequency case for UE **c**ategory NB1 In-Band mode in normal coverage	Ncell1	Ncell2	Cell1	
4.3.1.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA is of higher priority	Cell3	Cell9		
4.3.1.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA is of lower priority	Cell3	Cell9		
4.3.1.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority	Cell3	Cell9		
4.3.1.4	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz Bandwidth	Cell3	Cell9		
4.3.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN TDD cell re-selection	Cell6	Cell8		
4.3.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN FDD cell re-selection	Cell6	Cell8		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
4.3.4.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of higher priority	Cell6	Cell8		
4.3.4.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority	Cell6	Cell8		
4.3.4.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection /EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	Cell3	Cell9		
4.4.1	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN FDD - GSM cell re-selection	Cell1	Cell26		
4.4.2	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN TDD - GSM cell re-selection	Cell1	Cell26		
4.5.1.1	RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	Cell1	Cell15		
4.5.2.1	RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority	Cell1	Cell15		
4.6.1.1	RRC IDLE / E-UTRAN to cdma2000 1xRTT Cell re-selection / E-UTRAN FDD - cdma2000 1xRTT cell re-selection: cdma2000 1x is of lower priority	Cell1	Cell19		
4.6.2.1	RRC IDLE / E-UTRAN to cdma2000 1xRTT Cell re-selection / E-UTRAN TDD - cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority	Cell1	Cell19		
5.1.1	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Intra frequency case	Cell1	Cell2		
5.1.2	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Intra frequency case	Cell1	Cell2		
5.1.3	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Inter frequency case	Cell6	Cell3		
5.1.4	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Inter frequency case	Cell6	Cell3		
5.1.5	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Inter frequency case: unknown target cell	Cell6	Cell3		
5.1.6	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Inter frequency case: unknown target cell	Cell6	Cell3		
5.1.7	RRC CONNECTED / E-UTRAN Handover / FDD – TDD / Inter frequency case	Cell1	Cell10	Dual mode in multiple PLMN	
5.1.8	RRC CONNECTED / E-UTRAN Handover / TDD – FDD / Inter frequency case	Cell10	Cell1		
5.1.9	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Intra frequency handover for 5MHz Bandwidth	Cell1	Cell2		
5.1.10	E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0	Cell1	Cell2		
5.1.11	E-UTRAN HD-FDD Handover intra frequency handover for UE category 0	Cell1	Cell2		
5.1.12	E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0	Cell1	Cell2		
5.1.13	E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Cell1	Cell2		
5.1.14	E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Cell1	Cell2		
5.1.15	E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA	Cell1	Cell2		
5.2.1	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD - UTRAN FDD handover	Cell3	Cell9		
5.2.2	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN TDD - UTRAN FDD handover	Cell6	Cell8		
5.2.3	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to GSM / E-UTRAN FDD - GSM handover	Cell1	Cell26		
5.2.4	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN TDD - UTRAN TDD handover	Cell3	Cell9		
5.2.5	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD - UTRAN TDD	Cell6	Cell8		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	handover				
5.2.6	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to GSM / E-UTRA TDD - GSM handover	Cell1	Cell26		
5.2.7	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - UTRAN FDD handover: unknown target cell	Cell3	Cell9		
5.2.8	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - GSM handover: unknown target cell	Cell1	Cell26		
5.2.9	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN TDD - GSM Handover: unknown target cell	Cell1	Cell26		
5.2.10	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	Cell6	Cell8		
5.2.11	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth	Cell3	Cell9		
5.3.1	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	Cell1	Cell15		
5.3.2	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – cdma2000 1xRTT handover	Cell1	Cell19		
5.3.3	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD Handover: unknown target cell	Cell1	Cell15		
5.3.4	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD - cdma2000 1xRTT Handover: unknown target cell	Cell1	Cell19		
5.3.5	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN TDD-HRPD Handover	Cell1	Cell15		
5.3.6	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN TDD-cdma2000 1X Handover	Cell1	Cell19		
6.1.1	RRC Connection Mobility Control / E-UTRAN FDD Intra-frequency RRC Re-establishment	Cell1	Cell2		
6.1.2	RRC Connection Mobility Control / E-UTRAN FDD Inter-frequency RRC Re-establishment	Cell6	Cell3		
6.1.3	RRC Connection Mobility Control / E-UTRAN TDD Intra-frequency RRC Re-establishment	Cell1	Cell2		
6.1.4	RRC Connection Mobility Control / E-UTRAN TDD Inter-frequency RRC Re-establishment	Cell6	Cell3		
6.1.5	RRC Connection Mobility Control / E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	Cell1	Cell2		
6.1.8	E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0	Cell1	Cell2		
6.1.9	E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Cell1	Cell2		
6.1.10	E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Cell1	Cell2		
6.1.11	E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Cell1	Cell2		
6.1.12	E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Cell1	Cell2		
6.1.13	E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Cell1	Cell2		
6.1.14	E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Cell1	Cell2		
6.2.1	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Contention Based Random Access	Cell1			
6.2.2	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Non-Contention Based Random Access	Cell1			
6.2.3	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Contention Based Random Access	Cell1			
6.2.4	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Non-Contention Based Random Access	Cell1			
6.2.5	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth	Cell1			
6.2.6	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth	Cell1			
6.2.7	E-UTRAN FDD – Non-Contention Based Random Access Test	Cell1	Cell2	Cell4	Intra-

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	For SCell in sTAG			Note1	band
		Cell1	Cell10	Cell30	Inter-band
6.2.8	E-UTRAN TDD – Non-Contention Based Random Access Test For SCell in sTAG	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
6.2.10	E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Cell1			
6.2.11	E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Cell1			
6.2.12	RRC Connection Mobility Control / Random Access / E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Cell1			
6.2.13	E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Cell1			
6.2.14	E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Cell1			
6.2.15	E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Cell1			
6.3.1	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to UTRAN FDD	Cell3	Cell9		
6.3.2	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to UTRAN FDD	Cell6	Cell8		
6.3.3	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to GERAN when System Information is provided	Cell1	Cell26		
6.3.4	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to GERAN when System Information is provided	Cell1	Cell26		
6.3.5	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA TDD RRC connection release redirection to UTRA TDD	Cell3	Cell9		
6.3.6	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA FDD RRC connection release redirection to UTRA TDD	Cell6	Cell8		
6.3.7	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Cell3	Cell9		
6.3.8	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Cell6	Cell8		
6.3.9	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Cell3	Cell9		
6.3.10	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN FDD to GERAN when System Information is not provided	Cell1	Cell26		
6.3.11	RRC Connection Mobility Control / RRC Connection Release with Redirection / Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Cell1	Cell26		
6.3.12	RRC Connection Mobility Control / RRC Connection Release with Redirection / E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Cell6	Cell8		
7.1.1	E-UTRAN FDD-UE Transmit Timing Accuracy	Cell1			
7.1.2	E-UTRAN TDD-UE Transmit Timing Accuracy	Cell1			
7.1.3	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.3_1	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Cell1	Cell2		Intra-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
		Cell1	Cell10		Inter-band
7.1.4	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.4A	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.4_1	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.5	E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	Cell1			
7.1.6	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.7	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.7A	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.7B	E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.1.8	Void				
7.1.9	Void				
7.1.10	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Cell1			
7.1.11	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Cell1			
7.1.12	E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Cell1			
7.1.14	E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Cell1			
7.1.15	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Cell1			
7.1.16	E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	Cell1			
7.1.17	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	Ncell1		Cell1	
7.1.18	E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Category NB1 UE In-band mode under enhanced coverage	Ncell1		Cell1	
7.2.1	E-UTRAN FDD-UE Timing Advance Adjustment Accuracy	Cell1			
7.2.2	E-UTRAN TDD-UE Timing Advance Adjustment Accuracy	Cell1			
7.2.3	E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	Cell1			
7.2.4	E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.2.5	E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.2.5A	E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth	Cell1	Cell2		Intra-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
		Cell1	Cell10		Inter-band
7.2.5B	E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
7.2.6	E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Cell1			
7.2.7	E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Cell1			
7.2.8	E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Cell1			
7.2.10	E-UTRAN FDD Timing Advance Adjustment Accuracy Test in CEModeB	Cell1			
7.2.11	E-UTRAN HD-FDD Timing Advance Adjustment Accuracy Test in CEModeB	Cell1			
7.2.12	E-UTRAN TDD Timing Advance Adjustment Accuracy Test in CEModeB	Cell1			
7.3.1	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	Cell1			
7.3.1_1	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	Cell1			
7.3.2	E-UTRAN FDD Radio Link Monitoring Test for In-sync	Cell1			
7.3.2_1	E-UTRAN FDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	Cell1			
7.3.3	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	Cell1			
7.3.3_1	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync with 4 Rx antenna ports	Cell 1			
7.3.4	E-UTRAN TDD Radio Link Monitoring Test for In-sync	Cell1			
7.3.4_1	E-UTRAN TDD Radio Link Monitoring Test for In-sync with 4 Rx antenna ports	Cell1			
7.3.5	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	Cell1			
7.3.6	E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	Cell1			
7.3.7	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	Cell1			
7.3.8	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	Cell1			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
7.3.9	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2		
7.3.10	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2		
7.3.11	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2		
7.3.12	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell1	Cell2		
7.3.13	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3		
7.3.14	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3		
7.3.15	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3		
7.3.16	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell3		
7.3.17	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4	
7.3.18	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4	
7.3.19	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4	
7.3.20	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4	
7.3.21	E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4	
7.3.22	E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC) (Note 3)	Cell1	Cell3	Cell4	
7.3.23	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	Cell1			
7.3.24	E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	Cell1			
7.3.25	E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	Cell1			
7.3.26	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Cell1			
7.3.27	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Cell1			
7.3.28	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Cell1			
7.3.29	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in	Cell1			

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	DRX for UE category 0				
7.3.30	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Cell1			
7.3.31	E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Cell1			
7.3.32	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Cell1			
7.3.33	E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Cell1			
7.3.34	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Cell1			
7.3.35	E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0	Cell1			
7.3.36	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Cell1			
7.3.37	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Cell1			
7.3.38	E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	Cell1	Cell10		
7.3.39	E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC	Cell1	Cell10		
7.3.40	E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	Cell1	Cell10		
7.3.41	E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	Cell1	Cell10		
7.3.42	E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC	Cell1	Cell10		
7.3.43	E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	Cell1	Cell10		
7.3.44	E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in FDD	Cell1	Cell10		
7.3.45	E-UTRAN TDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC with PCell in TDD	Cell1	Cell10		
7.3.46	E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in FDD	Cell1	Cell10		
7.3.47	E-UTRAN TDD-FDD Radio Link Monitoring Test for In-sync in DRX for PSCell in synchronous DC with PCell in TDD	Cell1	Cell10		
7.3.48	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Cell1			
7.3.49	E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Cell1			
7.3.50	E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Cell1			
7.3.51	E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Cell1			
7.3.52	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Cell1			
7.3.53	E-UTRAN HD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Cell1			
7.3.54	E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Cell1			
7.3.55	E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Cell1			
7.3.56	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	Cell1			
7.3.57	E-UTRAN TDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	Cell1			
7.3.58	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category M1 configured in CEMode A	Cell1			
7.3.59	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Cell1			
7.3.60	HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	Ncell1		Cell1	
7.3.61	HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in Enhanced Coverage	Ncell1		Cell1	

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
7.3.62	HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Enhanced Coverage	Ncell1		Cell1	
7.3.63	HD-FDD Radio Link Monitoring Test for In-sync with DRX for UE Category NB1 In-Band mode in Normal Coverage	Ncell1		Cell1	
7.3.64	HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Normal Coverage	Ncell1		Cell1	
7.3.65	HD-FDD Radio Link Monitoring Test for In-sync without DRX for UE Category NB1 In-Band mode in Enhanced Coverage	Ncell1		Cell1	
7.5.1	E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test	Cell 1			
7.5.4	E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test	Cell 1			
8.1.1	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell1	Cell2		
8.1.2	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.1.3	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2		
8.1.4	Void				
8.1.5	UE Measurement Procedures / E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell1	Cell2		
8.1.6	UE Measurement Procedures / E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell1	Cell2		
8.1.7	UE Measurement Procedures / E-UTRAN FDD-FDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Cell1	Cell2		
8.1.8	E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
8.1.9	E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth	Cell1	Cell2		
8.1.10	E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz bandwidth	Cell1	Cell2		
8.1.11	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	Cell1	Cell2		
8.1.12	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Cell1	Cell2		
8.1.13	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Cell1	Cell2		
8.1.17	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.1.18	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2		
8.1.23	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2		
8.1.24	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2		
8.1.25	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for	Cell1	Cell2		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	Cat-M1 UE in CEModeA in DRX				
8.1.26	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2		
8.1.27	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2		
8.1.28	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Cell1	Cell2		
8.1.29	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2		
8.1.30	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Cell1	Cell2		
8.1.31	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2		
8.1.32	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2		
8.1.33	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2		
8.1.34	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2		
8.1.35	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Cell1	Cell2		
8.1.29	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Cell1	Cell2		
8.1.30	E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Cell1	Cell2		
8.2.1	UE Measurement Procedures / E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.2.2	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2		
8.2.3	UE Measurement Procedures / E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell1	Cell2		
8.2.4	UE Measurement Procedures / E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell1	Cell2		
8.2.5	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event-triggered Reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Cell1	Cell2		
8.2.6	E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
8.3.1	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3		
8.3.2	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Cell6	Cell3		
8.3.3	UE Measurement Procedures / E-UTRAN FDD-FDD inter	Cell6	Cell3		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used				
8.3.4	UE Measurement Procedures / E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell6	Cell3		
8.3.5	UE Measurement Procedures / E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell6	Cell3		
8.3.6	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells	Cell6	Cell3		
8.4.1	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell6	Cell3		
8.4.2	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Cell6	Cell3		
8.4.3	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used	Cell6	Cell3		
8.4.4	UE Measurement Procedures / E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell6	Cell3		
8.4.5	UE Measurement Procedures / E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Cell6	Cell3		
8.5.1	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell3	Cell9		
8.5.2	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	Cell3	Cell9		
8.5.3	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Cell3	Cell9		
8.5.4	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions	Cell3	Cell9		
8.5.6	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions	Cell3	Cell9		
8.5.7	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz bandwidth	Cell3	Cell9		
8.6.1	UE Measurement Procedures / E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell8		
8.7.1	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	Cell6	Cell8		
8.7.2	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	Cell6	Cell8		
8.7.3	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	Cell3	Cell9		
8.7.4	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Cell3	Cell9		
8.8.1	UE Measurement Procedures / E-UTRAN FDD - GSM event triggered reporting in AWGN	Cell6	Cell26		
8.8.2	UE Measurement Procedures / E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN	Cell6	Cell26		
8.9.1	UE Measurement Procedures / E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	Cell6	Cell8		
8.9.2	UE Measurement Procedures / E-UTRAN FDD - UTRAN TDD	Cell6	Cell8		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	enhanced cell identification under AWGN propagation conditions				
8.10.1	UE Measurement Procedures / E-UTRAN TDD - GSM event triggered reporting in AWGN	Cell6	Cell26		
8.10.2	UE Measurement Procedures / E-UTRAN TDD - GSM event triggered reporting when DRX is used in AWGN	Cell6	Cell26		
8.11.1	UE Measurement Procedures / Monitoring of multiple layers / E-UTRAN FDD - E-UTRAN FDD and E-UTRAN FDD Inter-frequency event triggered reporting under fading propagation conditions	Cell1	Cell3	Cell6	
8.11.2	UE Measurement Procedures / Monitoring of multiple layers / E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Cell1	Cell3	Cell6	
8.11.3	UE Measurement Procedures / Monitoring of multiple layers / InterRAT E-UTRA FDD to E-UTRA FDD and UTRA FDD cell search	Cell1	Cell6	Cell8	
8.11.4	UE Measurement Procedures / Monitoring of multiple layers / InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	Cell1	Cell6	Cell8	
8.11.5	UE Measurement Procedures / Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Cell6	Cell3	Cell24	
8.11.6	UE Measurement Procedures / Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Cell6	Cell3	Cell24	
8.14.1	UE Measurement Procedures / E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell10	Cell1		
8.14.2	UE Measurement Procedures / E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Cell10	Cell1		
8.14.3	UE Measurement Procedures / E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell10	Cell1		
8.15.1	UE Measurement Procedures / E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell1	Cell10		
8.15.2	UE Measurement Procedures / E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Cell1	Cell10		
8.15.3	UE Measurement Procedures / E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Cell1	Cell10		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
8.16.1	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.2	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.3	UE Measurement Procedures / E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.4	UE Measurement Procedures / E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.5	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.6	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.7	UE Measurement Procedures / E-UTRAN FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.8	UE Measurement Procedures / E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.9	E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.10	E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.11	E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.12	E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.13	E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.14	E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.15	E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
8.16.16	E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5MHz+5MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.17	E-UTRAN FDD activation and deactivation of known SCell in non-DRX	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
8.16.17A	E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
8.16.18	E-UTRAN TDD activation and deactivation of known SCell in non-DRX	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
8.16.18A	E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth	Cell1	Cell2		Intra-band
		Cell1	Cell10		Inter-band
8.16.22	E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.16.23	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	Cell1	Cell10	Cell30	
8.16.24	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	Cell1	Cell10	Cell30	
8.16.25	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD	Cell1	Cell10	Cell30	
8.16.26	UE Measurement Procedures / E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD	Cell1	Cell10	Cell30	
8.18.1	UE Measurement Procedures / E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions	Cell1	Cell15		
8.19.1	UE Measurement Procedures / E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions	Cell1	Cell19		
8.20.1	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3 Note6	Cell13	Intra-band
		Cell6	Cell3	Cell10 Note4	Inter-band
8.20.2	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3 Note6	Cell13	Intra-band
		Cell6	Cell3	Cell10 Note4	Inter-band
8.20.2A	E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth	Cell6	Cell3 Note6	Cell13	Intra-band
		Cell6	Cell3	Cell10 Note4	Inter-band
8.20.3	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell8	Cell4	Intra-band
		Cell1	Cell8	Cell10	Inter-band
8.20.4	UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD to UTRAN TDD cell search under	Cell1	Cell8	Cell4	Intra-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	fading propagation conditions				
		Cell1	Cell8	Cell10	Inter-band
8.20.4A	E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	Cell1	Cell8	Cell4	Intra-band
		Cell1	Cell8	Cell10	Inter-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
8.22.1	UE Measurement Procedures / E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Cell1	Cell2		
8.22.2	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Cell1	Cell2		
8.22.3	UE Measurement Procedures / E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Cell6	Cell3		
8.22.4	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Cell6	Cell3		
8.22.5	UE Measurement Procedures / E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Cell1	Cell2		
8.22.6	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Cell1	Cell2		
8.22.7	UE Measurement Procedures / E-UTRAN FDD-FDD Inter-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Cell6	Cell3		
8.22.8	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal	Cell6	Cell3		
8.22.9	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.22.10	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.22.11	UE Measurement Procedures / E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.22.12	UE Measurement Procedures / E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
8.23.1	E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Cell1	Cell10		
8.23.2	E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC	Cell1	Cell10		
8.23.3	E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Cell1	Cell10		
8.23.4	E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Cell6	Cell3	Cell10 Note4	
8.23.5	E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC	Cell6	Cell3	Cell10 Note4	
8.23.6	E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Cell6	Cell3	Cell10 Note4	
8.26.9	E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.26.10	E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
9.1.1.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Absolute	Cell1	Cell2		
9.1.1.1_1	Measurement Performance Requirements / E-UTRAN / FDD	Cell1	Cell2		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)				
9.1.1.2	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Relative	Cell1	Cell2		
9.1.2.1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Absolute	Cell1	Cell2		
9.1.2.1_1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell1	Cell2		
9.1.2.2	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Relative	Cell1	Cell2		
9.1.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute	Cell6	Cell3		
9.1.3.1_1	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell6	Cell3		
9.1.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative	Cell6	Cell3		
9.1.3.2_1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative (Rel-12 and forward)	Cell6	Cell3		
9.1.4.1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Absolute	Cell6	Cell3		
9.1.4.1_1	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell6	Cell3		
9.1.4.2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative	Cell6	Cell3		
9.1.4.2_1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative (Rel-12 and forward)	Cell6	Cell3		
9.1.5.1	Measurement Performance Requirements / E-UTRAN / FDD – TDD Inter frequency RSRP Accuracy / Absolute	Cell1	Cell10		
9.1.5.1_1	Measurement Performance Requirements / E-UTRAN / FDD - TDD Inter Frequency Absolute RSRP Accuracy (Rel-12 and forward)	Cell1	Cell10		
9.1.5.2	Measurement Performance Requirements / E-UTRAN / FDD-TDD Inter frequency RSRP Accuracy / Relative	Cell1	Cell10		
9.1.5.2_1	Measurement Performance Requirements / E-UTRAN / FDD-TDD Inter frequency RSRP Accuracy / Relative (Rel-12 and forward)	Cell1	Cell10		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
9.1.6.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.6.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.6.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.6.2_1	Measurement Performance Requirements / FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.7.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.7.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.7.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.7.2_1	Measurement Performance Requirements / TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.8.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2		
9.1.8.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)	Cell1	Cell2		
9.1.8.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2		
9.1.9.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2		
9.1.9.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC) (Rel-12 and forward)	Cell1	Cell2		
9.1.9.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2		
9.1.10.1	Measurement Performance Requirements / FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6		
9.1.10.1_1	Measurement Performance Requirements / FDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward) (Note 3)	Cell1	Cell6		
9.1.10.2	Measurement Performance Requirements / FDD Relative	Cell1	Cell6		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)				
9.1.11.1	Measurement Performance Requirements / TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6		
9.1.11.1_1	Measurement Performance Requirements / TDD Absolute RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Rel-12 and forward) (Note 3)	Cell1	Cell6		
9.1.11.2	Measurement Performance Requirements / TDD Relative RSRP under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6		
9.1.12.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.12.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.12.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.13.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.13.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel-12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.13.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.14.1	FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
9.1.14.1_1	FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Rel-12 and forward) (Note 3)	Cell1	Cell2	Cell6	
9.1.14.2	FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
9.1.15.1	TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
9.1.15.1_1	TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
9.1.15.2	TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Cell1	Cell2	Cell6	

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	(Note 3)				
9.1.16.1	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	Cell1	Cell2		
9.1.16.1_1	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)	Cell1	Cell2		
9.1.16.2	Measurement Performance Requirements / E-UTRAN / FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Cell1	Cell2		
9.1.17.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute for 5 MHz	Cell1	Cell10		
9.1.17.1_1	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel-12 and forward)	Cell1	Cell10		
9.1.17.2	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Cell1	Cell10		
9.1.17.2_1	Measurement Performance Requirements / E-UTRAN / FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth (Rel-12 and forward)	Cell1	Cell10		
9.1.18.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.18.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel 12 and forward)	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.18.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.19.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.19.1_1	TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel 12 and forward)	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.19.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Cell6	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.20.1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.20.1_1	Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.20.2	Measurement Performance Requirements / FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
9.1.21.1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.21.1_1	Measurement Performance Requirements / TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.21.2	Measurement Performance Requirements / TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.22	FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD	Cell1	Cell10	Cell30	
9.1.23	FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD	Cell1	Cell10	Cell30	
9.1.24.1_1	TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel 12 and forward)	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.25	Measurement Performance Requirements / FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell1	Cell2		
9.1.26	Measurement Performance Requirements / TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell1	Cell2		
9.1.27	Measurement Performance Requirements / FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell6	Cell3		
9.1.28	Measurement Performance Requirements / TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Cell6	Cell3		
9.1.29	FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell1	Cell2		
9.1.30	TDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell1	Cell2		
9.1.31	Measurement Performance Requirements / FDD-FDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell6	Cell3		
9.1.32	Measurement Performance Requirements / TDD-TDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Cell6	Cell3		
9.1.33	Measurement Performance Requirements / FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.34	Measurement Performance Requirements / TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.35	Measurement Performance Requirements / FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.36	Measurement Performance Requirements / TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.1.41.1	FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Cell1	Cell2		
9.1.41.2	FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Cell1	Cell2		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
9.1.42.1	HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Cell1	Cell2		
9.1.42.2	HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Cell1	Cell2		
9.1.43.1	TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Cell1	Cell2		
9.1.43.2	TDD Intra Frequency Relative RSRP Accuracy for UE category 0	Cell1	Cell2		
9.1.52	FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Cell1	Cell2		
9.1.53	HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Cell1	Cell2		
9.1.54	TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Cell1	Cell2		
9.1.55	FDD intra frequency absolute and relative RSRP accuracies for SCell with frame structure 3	Cell1	Cell10	Cell30	Inter-band
9.1.57	FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Cell1	Cell2		
9.1.58	HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Cell1	Cell2		
9.1.59	TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Cell1	Cell2		
9.2.1.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRQ Accuracy / Absolute	Cell1	Cell2		
9.2.2.1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRQ Accuracy / Absolute	Cell1	Cell2		
9.2.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Absolute	Cell6	Cell3		
9.2.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Relative	Cell6	Cell3		
9.2.4.1	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Absolute	Cell6	Cell3		
9.2.4.2	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Relative	Cell6	Cell3		
9.2.4A.1	Measurement Performance Requirements / FDD - TDD Inter Frequency Absolute RSRQ Accuracy	Cell1	Cell10		
9.2.4A.2	Measurement Performance Requirements / FDD - TDD Inter Frequency Relative Accuracy of RSRQ	Cell1	Cell10		
9.2.5.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.5.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.6.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.6.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.7.1	Measurement Performance Requirements / FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2		
9.2.8.1	Measurement Performance Requirements / TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS (eICIC)	Cell1	Cell2		
9.2.9.1	Measurement Performance Requirements / FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC) (Note 3)	Cell1	Cell6		
9.2.10.1	Measurement Performance Requirements / TDD RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Cell1	Cell6		

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	(Note 3)				
9.2.11.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.11.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.12.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.12.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.15.1	FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
9.2.16.1	TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC) (Note 3)	Cell1	Cell2	Cell6	
9.2.17.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRQ Accuracy / Absolute for 5MHz	Cell1	Cell2		
9.2.18.1	Measurement Performance Requirements / FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	Cell1	Cell10		
9.2.18.2	Measurement Performance Requirements / FDD - FDD Inter Frequency Relative Accuracy of RSRQ for 5MHz Bandwidth	Cell1	Cell10		
9.2.19.1	Measurement Performance Requirements / FDD-FDD Inter Frequency absolute WB-RSRQ accuracy	Cell6	Cell3		
9.2.20.1	Measurement Performance Requirements / TDD-TDD Inter Frequency absolute WB-RSRQ accuracy	Cell6	Cell3		
9.2.21.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.21.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.22.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.22.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.23.1	Measurement Performance Requirements / FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.23.2	Measurement Performance Requirements / FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
9.2.24.1	Measurement Performance Requirements / TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.24.2	Measurement Performance Requirements / TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.25.1	Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Cell1	Cell10		
9.2.25.2	Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Cell1	Cell10		
9.2.26.1	Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Cell1	Cell10		
9.2.26.2	Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Cell1	Cell10		
9.2.28	Measurement Performance Requirements / FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Cell1	Cell2		
9.2.29	Measurement Performance Requirements / TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Cell1	Cell2		
9.2.30	Measurement Performance Requirements / FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Cell6	Cell3		
9.2.31	Measurement Performance Requirements / TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Cell6	Cell3		
9.2.32	Measurement Performance Requirements / FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.33	Measurement Performance Requirements / TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	Cell1	Cell2	Cell4 Note1	Intra-band
		Cell1	Cell10	Cell30	Inter-band
9.2.51	FDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3				
9.2.52	TDD intra frequency absolute and relative RSRQ accuracies for SCell with frame structure 3				
9.3.1	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	Cell3	Cell9		
9.3.2	Measurement Performance Requirements / E-UTRAN TDD-UTRA FDD CPICH RSCP absolute accuracy	Cell3	Cell9		
9.3.3	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	Cell3	Cell9		
9.4.1	Measurement Performance Requirements / E- UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy	Cell3	Cell9		
9.4.2	Measurement Performance Requirements / E- UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy	Cell3	Cell9		
9.4.3	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	Cell3	Cell9		
9.5.1	Measurement Performance Requirements / E- UTRAN FDD - UTRA TDD P-CCPCH RSCP absolute accuracy	Cell3	Cell9		
9.5.2	Measurement Performance Requirements / E- UTRAN TDD - UTRA TDD P-CCPCH RSCP absolute accuracy	Cell3	Cell9		
9.6.1	Measurement Performance Requirements / GSM RSSI accuracy for E-UTRAN FDD	Cell1	Cell26	Cell24	
9.6.2	Measurement Performance Requirements / GSM RSSI	Cell1	Cell26	Cell24	

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2	36.521-3 Cell3	CA Type (Note 2)
	accuracy for E-UTRAN TDD				
9.9.1.1	Measurement Performance Requirements / FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Cell1			
9.9.1.1_1	Measurement Performance Requirements / FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)	Cell1			
9.9.1.2	Measurement Performance Requirements / FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	Cell1			
9.9.2.1	Measurement Performance Requirements / TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Cell1			
9.9.2.1_1	Measurement Performance Requirements / TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel-12 and forward)	Cell1			
9.9.2.2	Measurement Performance Requirements / TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	Cell1			

Note 1: Neighbour cell uses same frequency as SCC.
Note 2: “Intra-band” notation in the table refers to both intra-band contiguous and intra-band non-contiguous CA configuration as applicable.
Note 3: All cells are intra frequency and shall use the same range (mid) independently of the range information given in TS 36.508 Table 4.4.2-1.
Note 4: Low range shall be used independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 5: The frequency range remains unchanged after any change of Cell IDs in the test procedure.
Note 6: Mid range shall be used for intra-band non-contiguous CA independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 7: For operating band 66 “High Range” simulated cells for all test cases shall be configured according to “High Range” as defined in TS36.508 Table 4.3.1.1.66 when UL is not configured on the cell. Otherwise “Paired High Range” shall be configured.

Table E-2: Cell configuration mapping for 3DL CA RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3		36.521-3 Cell4		36.521-3 Cell5	
	Default Test Settings for a CA_XA-YC Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
8.16.27 8.16.31	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a XA-YA-ZA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Z	Cell3	Z	Cell4		
	Default Test Settings for a XA-YA-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	Y	Cell1	X	Cell2	X	Cell3	X	Cell4		
	Default Test Settings for a XA-YA-ZA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
8.16.28 8.16.32	Z	Cell1	X	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a XA-XA-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	Y	Cell1	X	Cell2	X	Cell3	X	Cell4		
	Default Test Settings for a CA_XA-YC Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4		
8.16.29 8.16.30 8.16.33 8.16.34	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	X	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XA-YA-ZA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	Y	Cell2	Z	Cell3	Z	Cell4		
	Default Test Settings for a CA_XA-XA-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	X	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XA-YA-YA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			

	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4		
	Default Test Settings for a CA_XD/XA-XC/XC-XA Configuration									
	PCC		SCC1		SCC2		Neigh			
	Band		Band		Band		Band			
	X	Cell1	X	Cell2	X	Cell3	X	Cell4		
	Default Test Settings for a CA_XA-YC Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
9.1.37	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a XA-YA-ZA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Z	Cell4	Z	Cell6
	Default Test Settings for a XA-YA-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band			
	Y	Cell1	X	Cell2	X	Cell3	X	Cell4	X	Cell6
	Default Test Settings for a XA-YA-ZA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
9.1.38	Z	Cell1	X	Cell2	X	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a XA-XA-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band			
	Y	Cell1	X	Cell2	X	Cell3	X	Cell4	X	Cell6
	Default Test Settings for a CA_XA-YC Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4	Y	Cell6
	Y	Cell1	Y	Cell2	Y	Cell3	X	Cell4	X	Cell6
	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
9.1.39 9.1.39_1 9.1.40 9.1.40_1	Band		Band		Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell3	Y	Cell4	Y	Cell6
	Y	Cell1	X	Cell2	X	Cell3	X	Cell4	X	Cell6
	Default Test Settings for a CA_XA-YA-ZA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Z	Cell4	Z	Cell6
	Y	Cell1	X	Cell2	X	Cell3	Z	Cell4	Z	Cell6
	Z	Cell1	X	Cell2	X	Cell3	Y	Cell4	Y	Cell6
	Default Test Settings for a CA_XA-XA-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	

	Band		Band		Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell3	Y	Cell4	Y	Cell6
	Y	Cell1	X	Cell2	X	Cell3	X	Cell4	X	Cell6
	Default Test Settings for a CA_XA-YA-YA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	Y	Cell2	Y	Cell3	Y	Cell4	Y	Cell6
	Y	Cell1	Y	Cell2	Y	Cell3	X	Cell4	X	Cell6
	Default Test Settings for a CA_XD/CA_XA-XC/CA_XC-XA Configuration									
	PCC		SCC1		Neigh		SCC2		Neigh	
	Band		Band		Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell3	X	Cell4	X	Cell6
8.16.35	Default Test Settings for a CA_XA-YC Configuration									
8.16.39 9.2.38	PCC		SCC1		SCC2					
	Band		Band		Band					
	X	Cell1	Y	Cell2	Y	Cell3				
	Default Test Settings for a CA_XA-YA-ZA Configuration									
	PCC		SCC1		SCC2					
	Band		Band		Band					
	X	Cell1	Y	Cell2	Z	Cell3				
	Default Test Settings for a XA-YA-YA Configuration									
	PCC		SCC1		SCC2					
	Band		Band		Band					
	X	Cell1	Y	Cell2	Y	Cell3				
	Default Test Settings for a CA_XC-YA Configuration									
	PCC		SCC1		SCC2					
	Band		Band		Band					
	Y	Cell1	X	Cell2	X	Cell3				
8.16.36	Default Test Settings for a CA_XA-YA-ZA Configuration									
8.16.40 9.2.39	PCC		SCC1		SCC2					
	Band		Band		Band					
	Z	Cell1	X	Cell2	Y	Cell3				
	Default Test Settings for a XA-XA-YA Configuration									
	PCC		SCC1		SCC2					
	Band		Band		Band					
	Y	Cell1	X	Cell2	X	Cell3				
	Default Test Settings for a CA_XA-YC Configuration									
8.16.37	PCC		SCC1		SCC2					
8.16.38	Band		Band		Band					
8.16.41	X	Cell1	Y	Cell2	Y	Cell3				
8.16.42	Default Test Settings for a CA_XC-YA Configuration									
9.2.40	PCC		SCC1		SCC2					
9.2.41	Band		Band		Band					
	X	Cell1	X	Cell2	Y	Cell3				
	Default Test Settings for a CA_XA-YA-ZA Configuration									
	PCC		SCC1		SCC2					

	Band X	Cell1	Band Y	Cell2	Band Z	Cell3				
	Default Test Settings for a CA_XA-XA-YA Configuration									
	PCC		SCC1		SCC2					
	Band X	Cell1	Band X	Cell2	Band Y	Cell3				
	Default Test Settings for a CA_XA-YA-YA Configuration									
	PCC		SCC1		SCC2					
	Band X	Cell1	Band Y	Cell2	Band Y	Cell3				
	Default Test Settings for a CA_XD / CA_XA-XC / CA_XC-XA Configuration									
	PCC		SCC1		SCC2					
	Band X	Cell1	Band X	Cell2	Band X	Cell3				
Note1: All cells shall use the same range (mid) independently of the range information given in Table 4.4.2-1 of TS 36.508 [7]. Note2: X, Y, Z correspond to the different bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1[10]. E.g. for CA_1A-3A-19A, X=1, Y=3, Z=19.										

Table E-3: Cell configuration mapping for 2DL CA 20MHz+10MHz RRM testing

Test Case	36.521-3 Cell1		36.521-3 Cell2		36.521-3 Cell3	
8.16.21	Default Test Settings for a CA_XA-YA Configuration					
	PCC		SCC1		Neigh	
	Band		Band		Band	
	X	Cell1	Y	Cell10	Y	Cell30
	Y	Cell1	X	Cell10	X	Cell30
	Default Test Settings for a CA_XC Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1
8.20.2B	Default Test Settings for a CA_XA-YA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell6	Y	Cell3	Y	Cell10 Note5
	Y	Cell6	X	Cell3	X	Cell10 Note5
	Default Test Settings for a CA_XC Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell6	X	Cell3	X	Cell13
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell6	X	Cell3 Note6	X	Cell13
8.20.4B	Default Test Settings for a CA_XA-YA Configuration					
	PCC		Neigh (UTRA)		SCC1	
	Band		Band		Band	
	X	Cell1	Y	Cell8	Y	Cell10
	Y	Cell1	X	Cell8	X	Cell10
	Default Test Settings for a CA_XC Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell8	X	Cell4
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		Neigh		SCC1	
	Band		Band		Band	
	X	Cell1	X	Cell8	X	Cell4
	Default Test Settings for a CA_XA-YA Configuration					
	PCC		SCC1		Neigh	

	Band		Band		Band	
9.1.24.1	X	Cell1	Y	Cell10	Y	Cell30
9.1.24.2	Y	Cell1	X	Cell10	X	Cell30
9.2.27.1	Default Test Settings for a CA_XC Configuration					
9.2.27.2	PCC		SCC1		Neigh	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1
	Default Test Settings for a CA_XA-XA Configuration					
	PCC		SCC1		Neigh	
	Band		Band		Band	
	X	Cell1	X	Cell2	X	Cell4 Note1

Note 1: Neighbour cell uses same frequency as SCC.
Note 2: X, Y correspond to the different bands in the CA Configuration is specified in 5.4.2A.1 of TS 36.521-1[10]. E.g. for CA_1A-3A, X=1, Y=3.
Note 3: For intra-band contiguous and intra-band non-contiguous CA, 20 MHz for PCC, 10MHz for SCC are tested.
Note 4: For inter-band CA configuration, 20 MHz for band X and 10 MHz for band Y are tested if X supports 20 MHz and Y supports 10 MHz. Otherwise, 10 MHz for band X and 20 MHz for band Y are tested.
Note 5: Low range shall be used independently on the range information given in TS 36.508 Table 4.4.2-1.
Note 6: Mid range shall be used independently on the range information given in TS 36.508 Table 4.4.2-1.

Table E-4: Ncell and Cell configuration mapping for RRM testing of Category NB1

Test Case	Description	36.521-3 Ncell1	36.521-3 Ncell2	36.521-3 Cell1	36.521-3 Cell2
6.1.15	HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 under normal coverage	Ncell1	Ncell2	Cell1	
6.1.16	HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 under enhanced coverage	Ncell1	Ncell3	Cell1	
7.2.9	HD-FDD UE Timing Advance Adjustment Accuracy Test for UE Category NB1 in Standalone Mode under Enhance Coverage	Ncell1			

Annex F (normative): Measurement uncertainties and Test Tolerances

The requirements of this clause apply to all applicable tests in the present document.

F.1 Acceptable uncertainty of Test System (normative)

See TS 36.521-1[10] Annex F1.

F.1.1 Measurement of test environments

See TS 36.521-1[10] Annex F1.1.

F.1.2 Measurement of RRM requirements

Table F.1.2-1: Maximum Test System Uncertainty for RRM Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
4.2.1 E-UTRA FDD - FDD cell re-selection intra frequency	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
4.2.2 E-UTRA TDD - TDD cell re-selection intra frequency	Same as 4.2.1	
4.2.3 E-UTRA FDD - FDD cell re-selection inter frequency	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
4.2.4 E-UTRA FDD - TDD cell re-selection inter frequency	Same as 4.2.3	
4.2.5 E-UTRA TDD - FDD cell re-selection inter frequency	Same as 4.2.3	
4.2.6 E-UTRA TDD - TDD cell re-selection inter frequency	Same as 4.2.3	
4.2.7 E-UTRA FDD Inter frequency re-selection in the existence of non-allowed CSG cell	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN $\hat{E}s_3$ / N_{oc1} is the ratio of cell 3 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
4.2.8 E-UTRA TDD Inter frequency re-selection in the existence of non-allowed CSG cell	Same as 4.2.7	
4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth	Same as 4.2.1	
4.2.12 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	
4.2.13 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	
4.2.14 E-UTRA TDD - TDD intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	
4.2.15 E-UTRAN FDD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.1	
4.2.16 E-UTRAN HD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.1	
4.2.17 E-UTRAN TDD - TDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.1	

4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.3 EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth	Same as 4.3.1.2	
4.3.2 E-UTRA FDD - UTRAN TDD cell re-selection	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB $\hat{I}_{or}$ / I_{oc} ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 frequency $\hat{I}_{or}$ / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	Same as 4.3.1.2	

4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of higher priority	E-UTRA cell Noc ±1.0 dB averaged over BWConfig Ês / Noc ±0.3 dB averaged over BWConfig UTRA cell Ioc ±0.7 dB Îor / Ioc ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: Noc is the AWGN on cell 1 frequency Ês / Noc is the ratio of cell 1 signal / AWGN Ioc is the AWGN on cell 2 frequency Îor / Ioc is the ratio of cell 2 signal / AWGN PCCPCH Ec / Ior is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
4.3.4.2 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of lower priority	Same as 4.3.2	
4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB $Î_{or}$ / I_{oc} ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 (E-UTRA) frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Each Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cell 2 (UTRA) frequency $Î_{or}$ / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
4.4.1 E-UTRAN FDD - GSM cell re-selection	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
4.4.2 E-UTRAN TDD - GSM cell re-selection	Same as 4.4.1	
4.5.1.1 RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} HRPD cell I_{oc} ±2.0 dB $Î_{or}$ / I_{oc} ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (HRPD) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN
4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority	Same as 4.5.1.1	Same as 4.5.1.1

5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Same as 5.1.1	Same as 5.1.1
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3
5.1.5 E-UTRAN FDD-FDD inter-frequency Handover with unknown target cell	Same as 5.1.1	Same as 5.1.1
5.1.6 E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	Same as 5.1.1	Same as 5.1.1
5.1.7 E-UTRAN FDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3
5.1.8 E-UTRAN TDD-FDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3
5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth	Same as 5.1.1	Same as 5.1.1
5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1
5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1
5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1
5.1.13 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.1	Same as 5.1.1
5.1.14 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.1	Same as 5.1.1
5.1.15 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.1	Same as 5.1.1
5.2.1 E-UTRAN FDD - UTRAN FDD handover	E-UTRA cell N_{oc} ±1.0dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH Ec/I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH Ec / Ior is the fraction of cell 2 power assigned to the CPICH Physical channel
5.2.2 E-UTRAN TDD - UTRAN FDD handover	Same as 5.2.1	Same as 5.2.1

5.2.3 E-UTRAN FDD - GSM handover	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
5.2.4 E-UTRA TDD – UTRA TDD handover	E-UTRA Cell: N_{oc} ± 1.0 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ± 0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ± 0.7 dB $\hat{I}_{or}$ / I_{oc} ± 0.3 dB P-CCPCH_E_c / I_{or} ± 0.1 dB DwPCH_E_c / I_{or} ± 0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}_s$ / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 frequency $\hat{I}_{or}$ / I_{oc} is the ratio of cell 2 signal / AWGN P-CCPCH_E_c / I_{or} is the fraction of cell 2 power assigned to the P-CCPCH physical channel. DwPCH_E_c / I_{or} is the fraction of cell 2 power assigned to the DwPCH channel
5.2.5 E-UTRA FDD – UTRA TDD handover	Same as 5.2.4	Same as 5.2.4
5.2.6 E-UTRA TDD - GSM handover	Same as 5.2.3	Same as 5.2.3
5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction on Cell 2 power assigned to the CPICH physical channel
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell	Same as 5.2.3	Same as 5.2.3
5.2.9 E-UTRAN TDD – GSM handover: unknown target cell	Same as 5.2.3	Same as 5.2.3
5.2.10 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA TDD cell I_{oc} ±0.7 dB Ior/Ioc ±0.3 dB PCCPCH_Ec /Ior ±0.1 dB DwPCH_Ec /Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA TDD) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN PCCPCH_Ec /Ior is the fraction of Cell 2 power assigned to the PCCPCH physical channel DwPCH_Ec /Ior is the fraction of Cell 2 power assigned to the DwPCH physical channel
5.2.11 E-UTRAN FDD – UTRAN FDD Handover for 5MHz Bandwidth	Same as 5.2.1	Same as 5.2.1
5.3.1 RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	<u>E-UTRA cell</u> N_{oc} ±0.7 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} <u>HRPD cell</u> I_{oc} ±2.0 dB $\hat{I}_{or}$ / I_{oc} ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (HRPD) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN
5.3.5 E-UTRAN TDD - HRPD handover	Same as 5.3.1	Same as 5.3.1
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment	Same as 5.1.1	Same as 5.1.1

6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment	Same as 6.1.1	Same as 6.1.1
6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment	Same as 6.1.3	Same as 6.1.3
6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	Same as 6.1.1	Same as 6.1.1
6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.6	Same as 6.1.6
6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.6	Same as 6.1.6
6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1
6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1
6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1
6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.1	Same as 6.1.1
6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.1	Same as 6.1.1
6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.1	Same as 6.1.1
6.2.1 E-UTRAN FDD - Contention Based Random Access Test	Test 1 and Test 2: N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.3 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.4 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.5 E-UTRAN FDD – Contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1

6.2.6 E-UTRAN FDD – Non-contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1
6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG	Test 1, Test 2 and Test 3 N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG	Same as 6.2.7	Same as 6.2.7
6.2.12 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Same as 6.2.1	Same as 6.2.1
6.2.13 E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Test 1 and Test 2: N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±1.0 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.14 E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13
6.2.15 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13
6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB SCH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior and SCH_Ec/Ior are the fractions of Cell 2 power assigned to the CPICH and SCH physical channels
6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD	Same as 6.3.1	Same as 6.3.1

6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided	Same as 6.3.3	Same as 6.3.3
6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB PCCPCH_Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 frequency $\hat{I}_{or}$ / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD	Same as 6.3.5	Same as 6.3.5
6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5
6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5
6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Same as 6.3.1	Same as 6.3.1
6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3
6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3
6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Same as 6.3.1	Same as 6.3.1
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy	N_{oc} ±3.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy	Same as 7.1.1	Same as 7.1.1
7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s1}$ / N_{oc1} ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s2}$ / N_{oc2} ±0.3 dB ±3T_S Uplink signal transmit timing relative to downlink ±0.5T_S relative during UE timing adjustment	Note: $\hat{E}s$ / N_{oc} is the ratio of cell signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Same as 7.1.3	Same as 7.1.3
7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell	Same as 7.1.3	Same as 7.1.3
7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Same as 7.1.3	Same as 7.1.3
7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth	Same as 7.1.3	Same as 7.1.3
7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	Same as 7.1.1	Same as 7.1.1
7.1.6 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s1}$ / N_{oc1} ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}_{s2}$ / N_{oc2} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: Ês / N_{oc} is the ratio of cell signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Same as 7.1.6	Same as 7.1.6
7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth	Same as 7.1.6	Same as 7.1.6
7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth	Same as 7.1.6	Same as 7.1.6
7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Same as 7.1.1	Same as 7.1.1
7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	FFS	FFS
7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	FFS	FFS
7.1.16 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	FFS	FFS
7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB Timing Advance Adjustment: ±0.5T_s	Note: $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN The timing unit T_S = 1/(15000 * 2048) seconds, as defined in TS.36.211 [9]
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy	Same as 7.2.1	Same as 7.2.1
7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	Same as 7.2.1	Same as 7.2.1

7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB N_{oc2} ±3.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB Timing Advance Adjustment: ±0.5T_s	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN The timing unit T_S = 1/(15000 * 2048) seconds, as defined in TS.36.211 [9]
7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	Same as 7.2.4	Same as 7.2.4
7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth	Same as 7.2.1	Same as 7.2.1
7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth	Same as 7.2.1	Same as 7.2.1
7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1
7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1
7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	± 0.6dB (Subtest 1&2, AWGN conditions) ± 0.8dB (Subtest 3, Fading conditions, single antenna transmission) ± 0.9dB (Subtest 4, Fading conditions, two antenna transmission)	Subtests 1 & 2: Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB Subtests 3: Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.5 dB for single Tx Subtest 4: Same calculations as for subtest 3 but with Fading profile uncertainty of ±0.7 for two Tx.
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync	± 0.8dB (Subtest 1, Fading conditions, single antenna transmission) ± 0.9dB (Subtest 2, Fading conditions, two antenna transmission)	Subtest 1: See 7.3.1 subtest 3 Subtest 2: See 7.3.1 subtest 4
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	Same as 7.3.1	Same as 7.3.1
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync	Same as 7.3.2	Same as 7.3.2
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	±0.9dB (Subtest 1, Fading conditions, two antenna transmission) ± 0.6dB (Subtest 2, AWGN conditions)	Subtest 1: See 7.3.1, subtest 4 Subtest 2: See 7.3.1, subtest 1
7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	± 0.6dB (AWGN conditions)	See 7.3.1, subtest 1
7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	±0.9dB (Subtest 1, Fading conditions, two antenna transmission) ± 0.6dB (Subtest 2, AWGN conditions)	Subtest 1: See 7.3.1, subtest 4 Subtest 2: See 7.3.1, subtest 1
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	± 0.6dB (AWGN conditions)	See 7.3.1, subtest 1

7.3.9 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell 1: $\hat{E}s_1/N_{oc}$ ± 0.9 dB Cell 2: $\hat{E}s_2/N_{oc}$ ± 0.9 dB $\hat{E}s_2/\hat{E}s_1$ ± 1.1 dB	System uncertainties comprise a number of quantities which are selected according to their applicability in the equations below. Uncertainties are assumed to be uncorrelated, so can be root sum squared. For $\hat{E}s/N_{oc}$ uncertainty AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. For $\hat{E}s_2/\hat{E}s_1$ uncertainty AWGN flatness effect has been excluded, because it would cancel out for the ratio Es_2/Es_1. $\hat{E}s_1/N_{oc}$ or $\hat{E}s_2/N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) $\hat{E}s_2/\hat{E}s_1$ uncertainty = SQRT (Cell 1 SNR uncertainty ^{2} + Cell 1 Fading profile power uncertainty ^{2} + Cell 2 SNR uncertainty ^{2} + Cell 2 Fading profile power uncertainty ^{2}) <u>Component uncertainties:</u> Cell 1 SNR uncertainty (E_{s1} / N_{oc} ratio before fading) ±0.3 dB Cell 2 SNR uncertainty (E_{s2} / N_{oc} ratio before fading) ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx AWGN flatness and signal flatness ±2.0 dB
7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9

7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Cell 1: $Ês_1/N_{oc}$ ± 0.9 dB Cell 2: $Ês_2/N_{oc}$ ± 0.9 dB $Ês_2/ Ês_1$ ± 1.1 dB	System uncertainties comprise a number of quantities which are selected according to their applicability in the equations below. Uncertainties are assumed to be uncorrelated, so can be root sum squared. For $Ês/N_{oc}$ uncertainty AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. For $Ês_2/Ês_1$ uncertainty AWGN flatness effect has been excluded, because it would cancel out for the ratio Es_2/Es_1. $Ês_1/N_{oc}$ or $Ês_2/N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) $Ês_2/Ês_1$ uncertainty = SQRT (Cell 1 SNR uncertainty ^{2} + Cell 1 Fading profile power uncertainty ^{2} + Cell 2 SNR uncertainty ^{2} + Cell 2 Fading profile power uncertainty ^{2}) <u>Component uncertainties:</u> Cell 1 SNR uncertainty (E_{s1} / N_{oc} ratio before fading) ±0.3 dB Cell 2 SNR uncertainty (E_{s2} / N_{oc} ratio before fading) ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx AWGN flatness and signal flatness ±2.0 dB
7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11
7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9
7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9
7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11
7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11

7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Cell 1: $\hat{E}s_1/N_{oc}$ ± 0.9 dB Cell 2: $\hat{E}s_2/N_{oc}$ ± 0.9 dB Cell 3: $\hat{E}s_3/N_{oc}$ ± 0.9 dB $\hat{E}s_2/\hat{E}s_1$ ± 1.1 dB $\hat{E}s_3/\hat{E}s_1$ ± 1.1 dB	System uncertainties comprise a number of quantities which are selected according to their applicability in the equations below. Uncertainties are assumed to be uncorrelated, so can be root sum squared. For $\hat{E}s/N_{oc}$ uncertainty AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. For $\hat{E}s_2/\hat{E}s_1$ and $\hat{E}s_3/\hat{E}s_1$ uncertainty AWGN flatness effect has been excluded, because it would cancel out for the ratio Es_x/Es_1. $\hat{E}s_1/N_{oc}$, $\hat{E}s_2/N_{oc}$ or $\hat{E}s_3/N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) $\hat{E}s_2/\hat{E}s_1$ or $\hat{E}s_3/\hat{E}s_1$ uncertainty = SQRT (Cell 1 SNR uncertainty ^{2} + Cell 1 Fading profile power uncertainty ^{2} + Cell 2 SNR uncertainty ^{2} + Cell 2 Fading profile power uncertainty ^{2}) Component uncertainties: Cell 1 SNR uncertainty (E_{s1} / N_{oc} ratio before fading) ±0.3 dB Cell 2 SNR uncertainty (E_{s2} / N_{oc} ratio before fading) ±0.3 dB Cell 3 SNR uncertainty (E_{s3} / N_{oc} ratio before fading) ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx AWGN flatness and signal flatness ±2.0 dB
7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17
7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	± 0.9dB (Subtest 4, Fading conditions, two antenna transmission)	See 7.3.1, subtest 4

7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	± 0.9dB (Subtest 2, Fading conditions, two antenna transmission)	See 7.3.2, subtest 2
7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	±0.6dB (AWGN conditions)	See 7.3.1, subtest 1
7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for two Tx
7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0	Same as 7.3.26	[Same as 7.3.26
7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0	Same as 7.3.26	Same as 7.3.26
7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28

7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	Same as 7.3.28	Same as 7.3.28
7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for two Tx
7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC	Same as 7.3.38	Same as 7.3.38
7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	Same as 7.3.38	Same as 7.3.38
7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	± 0.6dB (AWGN conditions)	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC	Same as 7.3.41	Same as 7.3.41
7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	Same as 7.3.41	Same as 7.3.41
7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for one Tx

7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for one Tx
7.3.50: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.52 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for one Tx
7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	± 0.9dB (Fading conditions, two antenna transmission)	Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.7 dB for one Tx
7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	Same as 7.3.28	Same as 7.3.28
7.3.55: E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	Same as 7.3.28	Same as 7.3.28

7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test	N_{oc} ±3.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: Ês / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test	N_{oc} ±3.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: Ês / N_{oc} is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc} ±0.6 dB averaged over BW_{Config} $Ês_2$ / N_{oc} ±0.6 dB averaged over BW_{Config}	Note: $Ês_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $Ês_2$ / N_{oc} is the ratio of cell 2 signal / AWGN Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1
8.1.3 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1
8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $Ês_2$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $Ês_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $Ês_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.1.5	Same as 8.1.5
8.1.7 UE Measurement Procedures / E-UTRAN FDD-FDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc} ±0.6 dB averaged over BW_{Config} $Ês_2$ / N_{oc} ±0.6 dB averaged over BW_{Config}	Note: $Ês_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $Ês_2$ / N_{oc} is the ratio of cell 2 signal / AWGN Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB

8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_3 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of Cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of Cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of Cell 3 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth	Same as 8.1.1	Same as 8.1.1
8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth	Same as 8.1.3	Same as 8.1.3
8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Same as 8.1.11	Same as 8.1.11
8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.11	Same as 8.1.11

8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.8 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.8 dB dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / Fading $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / Fading $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx antennas
8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23
8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23
8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19
8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19
8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19
8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23
8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23

8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.8 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc} ±0.8 dB averaged over BW_{Config}	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN $\hat{E}s$ / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.7 dB for 2 Tx
8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33
8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33
8.2.1 E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1
8.2.3 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc} ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
8.2.4 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.2.3	Same as 8.2.3
8.2.5 UE Measurement Procedures / E-UTRAN TDD-TDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Same as 8.1.7	Same as 8.1.7
8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 8.1.8	Same as 8.1.8
8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19
8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19

8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN Each Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1
8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.3.4	Same as 8.3.4
8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells	Same as 8.3.4	Same as 8.3.4

8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN Each Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Same as 8.4.1	Same as 8.4.1
8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used	Same as 8.3.3	Same as 8.3.3
8.4.4 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
8.4.5 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.4.4	Same as 8.4.4
8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	E-UTRAN cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on Cell 1 frequency Ês / N_{oc} is the ratio of Cell 1 signal / AWGN Ês / N_{oc} uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction of Cell 2 power assigned to the CPICH physical channel

8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB SCH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction of Cell 2 power assigned to the CPICH physical channel SCH Ec/Ior is the fraction of Cell 2 power assigned to the SCH physical channel
8.5.3 E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Same as 8.5.1	Same as 8.5.1
8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}_s$ / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH E_c/I_{or} ±0.1 dB SCH E_c/I_{or} ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}_s$ / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on Cell 2 (UTRA) frequency I_{or}/I_{oc} is the ratio of Cell 2 signal/AWGN CPICH E_c/I_{or} is the fraction of Cell 2 power assigned to the CPICH physical channel SCH E_c/I_{or} is the fraction of Cell 2 power assigned to the SCH physical channel
8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions	Same as 8.5.4	Same as 8.5.4
8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth	Same as 8.5.1	Same as 8.5.1
8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	Same as 8.5.1	Same as 8.5.1
8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ês / N_{oc} uncertainty or I_{or} / I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty or I_{or} / I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	Same as 8.7.1	Same as 8.7.1

8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	E-UTRA cell Noc ±1.0 dB averaged over BW_{Config} Ês / Noc ±0.3 dB averaged over BW_{Config} UTRA cell Ioc ±0.7 dB Ior/Ioc ±0.3 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: Noc is the AWGN on cell 1 frequency Ês / Noc is the ratio of cell 1 signal / AWGN Ioc is the AWGN on cell 2 (UTRA) frequency Ior / Ioc is the ratio of cell 2 signal / AWGN PCCPCH Ec/Ior is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel
8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN	<u>E-UTRA Cell</u> N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.3 dB averaged over BW_{Config} <u>GSM cell</u> Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
8.8.2 E-UTRAN FDD- GSM event triggered reporting when DRX is used in AWGN	Same as 8.8.1	Same as 8.8.1
8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} Ês / N_{oc} ±0.6 dB averaged over BW_{Config} UTRA TDD cell I_{oc} ±0.7 dB Ior/Ioc ±0.6 dB PCCPCH_Ec /Ior ±0.1 dB DwPCH_Ec /Ior ±0.1 dB	N_{oc} is the AWGN on cell 1 frequency Ês / N_{oc} is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA TDD) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN PCCPCH_Ec /Ior is the fraction on Cell 2 power assigned to the CPCCPCH physical channel DwPCH_Ec /Ior is the fraction on Cell 2 power assigned to the DwPCH physical channel Ês / N_{oc} and Ior/Ioc uncertainty for fading condition comprise two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty
8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Same as 8.7.4	Same as 8.7.4
8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN	Same as 8.8.1	Same as 8.8.1
8.10.2 E-UTRAN TDD- GSM event triggered reporting when DRX is used in AWGN	Same as 8.8.2	Same as 8.8.2

8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency Ês3 / N_{oc3} is the ratio of cell 3 signal / AWGN $\hat{E}s_2$ / N_{oc2} uncertainty or $\hat{E}s_3$ / N_{oc3} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Same as 8.11.1	Same as 8.11.1
8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN Ioc is the AWGN on Cell 3 (UTRA) frequency Ior/Ioc is the ratio of Cell 3 signal/AWGN CPICH Ec/Ior is the fraction of Cell 3 power assigned to the CPICH physical channel $\hat{E}s_2$ / N_{oc2} uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB

8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN I_{oc} is the AWGN on cell 3 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 3 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 3 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 3 power assigned to the DwPCH channel $Ês_2 / N_{oc2}$ uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $Ês / N_{oc}$ or I_{or}/I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Cell 3 (GSM) has only the wanted signal, without AWGN $Ês_1 / N_{oc1}$ uncertainty or $Ês_2 / N_{oc2}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $Ês / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Same as 8.11.5	Same as 8.11.5
8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1

8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1
8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4
8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1
8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1
8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4
8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc2} ±0.6 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} uncertainty and $\hat{E}s_3$ / N_{oc2} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX	Same as 8.16.1	Same as 8.16.1

8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} $Ês_3$ / N_{oc2} ±0.3 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $Ês_1$ / N_{oc1} is the ratio of Cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $Ês_2$ / N_{oc2} is the ratio of Cell 2 signal / AWGN $Ês_3$ / N_{oc2} is the ratio of Cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Same as 8.16.3	Same as 8.16.3
8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Same as 8.16.1	Same as 8.16.1
8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	Same as 8.16.1	Same as 8.16.1
8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Same as 8.16.3	Same as 8.16.3
8.16.8 E-UTRAN TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Same as 8.16.3	Same as 8.16.3
8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.12 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Same as 8.16.1	Same as 8.16.1
8.16.15 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.16 E-UTRAN TDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3
8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX	Same as 8.16.37	Same as 8.16.37

8.16.17A E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX	Same as 8.16.17	Same as 8.16.17
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17
8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth	Same as 8.16.1	Same as 8.16.1
8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	Same as 8.16.3	Same as 8.16.3
8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	Same as 8.16.1	Same as 8.16.1
8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	Same as 8.16.1	Same as 8.16.1
8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD	Same as 8.16.3	Same as 8.16.3
8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD	Same as 8.16.3	Same as 8.16.3
8.16.27 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc3} ±0.6 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN $\hat{E}s_4$ / N_{oc3} is the ratio of cell 4 signal / AWGN $\hat{E}s_2$ / N_{oc2}, $\hat{E}s_3$ / N_{oc3} uncertainty and $\hat{E}s_4$ / N_{oc3} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.28 E-UTRAN TDD-FDD 3DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD	Same as 8.16.27	Same as 8.16.27

8.16.29, 3DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27
8.16.30, 3DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27
8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $Ês_3$ / N_{oc3} ±0.3 dB averaged over BW_{Config} $Ês_4$ / N_{oc3} ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $Ês_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN $Ês_4$ / N_{oc3} is the ratio of cell 4 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD	Same as 8.16.31	Same as 8.16.31
8.16.33 E-UTRAN FDD 3DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31
8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31
8.16.35 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $Ês_3$ / N_{oc3} ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $Ês_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

8.16.36 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.37 3DL FDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.38 3DL TDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD	Same as 8.16.35	Same as 8.16.35
8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD	Same as 8.16.35	Same as 8.16.35
8.16.41 3 DL FDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.42 3 DL TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.35	Same as 8.16.35
8.16.57 4DL FDD CA Activation and Deactivation of Known SCell in Non-DRX	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.3 dB averaged over BW_{Config} N_{oc4} ±1.0 dB averaged over BW_{Config} $\hat{E}s_4$ / N_{oc4} ±0.3 dB averaged over BW_{Config} Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN N_{oc4} is the AWGN on frequency 4 $\hat{E}s_4$ / N_{oc4} is the ratio of cell 4 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.16.58 4DL TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.59 4DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.60 4DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.61 4DL FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.62 4DL TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.63 4DL PCell in FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57
8.16.64 4DL PCell in TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57

8.20.1 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 3 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN $\hat{E}s_1$ / N_{oc1} uncertainty, $\hat{E}s_2$ / N_{oc2} uncertainty, $\hat{E}s_3$ / N_{oc3} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.20.2 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.20.1	Same as 8.20.1
8.20.2A UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth	Same as 8.20.1	Same as 8.20.1
8.20.2B UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth	Same as 8.20.1	Same as 8.20.1

8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $Ês_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $Ês_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction of Cell 2 power assigned to the CPICH physical channel $Ês_1$ / N_{oc1} uncertainty, $Ês_3$ / N_{oc3} uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $Ês$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions	E-UTRA cells N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $Ês_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.6 dB PCCPCH Ec/Ior ±0.1 dB DwPCH_Ec/Ior ±0.1 dB	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $Ês_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_Ec/Ior is the fraction of cell 2 power assigned to the DwPCH channel $Ês_1$ / N_{oc1} uncertainty, $Ês_3$ / N_{oc3} uncertainty or I_{or}/I_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $Ês$ / N_{oc} or I_{or}/I_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	Same as 8.20.4	Same as 8.20.4

8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth	Same as 8.20.4	Same as 8.20.4
8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1
8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1
8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Same as 8.3.1	Same as 8.3.1
8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Same as 8.3.1	Same as 8.3.1
8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} CSI-RS $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 CRS signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 CRS signal / AWGN CSI-RS $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 CSI-RS signal / AWGN CSI-RS $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 CSI-RS signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	Same as 8.22.5	Same as 8.22.5
8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1
8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1

8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_1$ / N_{oc1} uncertainty, $\hat{E}s_2$ / N_{oc2} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.1	Same as 8.23.1
8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.1	Same as 8.23.1
8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} N_{oc3} ±1.0 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc3} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 3 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on cell 3 frequency $\hat{E}s_3$ / N_{oc3} is the ratio of cell 3 signal / AWGN $\hat{E}s_1$ / N_{oc1} uncertainty, $\hat{E}s_2$ / N_{oc2} uncertainty, $\hat{E}s_3$ / N_{oc3} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.4	Same as 8.23.4
8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.4	Same as 8.23.4

8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	N_{oc1} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±1.5dB averaged over BW_{Config} $\hat{E}s_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config} $\hat{E}s_3$ / N_{oc2} ±0.6 dB averaged over BW_{Config} Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s$ / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	Same as 8.26.5	Same as 8.26.5
8.26.9 E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	TBD	TBD
8.26.10 E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	TBD	TBD
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.1.1	Same as 9.1.1.1
9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.1.1	Same as 9.1.1.1

9.1.2.2 TDD Intra Frequency Relative RSRP Accuracy	Same as 9.1.1.2	Same as 9.1.1.2
9.1.3.1 FDD Inter Frequency Absolute RSRP Accuracy	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #22-27 $Ês_1$ / N_{oc1} and $Ês_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} and $Ês_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.3.1_1 FDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.2 FDD Inter Frequency Relative RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.3.2_1 FDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1 TDD Inter Frequency Absolute RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1_1 TDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2 TDD Inter Frequency Relative RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2_1 TDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1
9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #22-27 $Ês_1$ / N_{oc1} and $Ês_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} and $Ês_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #22-27 $Ês_1$ / N_{oc1} and $Ês_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} and $Ês_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.6.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $Ês_1$ / N_{oc1}, $Ês_2$ / N_{oc2} and $Ês_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc1}, $Ês_2$ / N_{oc2} and $Ês_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $Ês_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.1.6.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.1	Same as 9.1.6.1
9.1.6.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	
9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Same as 9.1.6.1	Same as 9.1.6.1
9.1.7.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	
9.1.7.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	
9.1.8.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.8.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	
9.1.9.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	
9.1.9.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	
9.1.10.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.10.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.11.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.11.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.8.1	
9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #47-52 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #47-52 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.1.12.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.1	Same as 9.1.12.1
9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.12.1	
9.1.12.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.12.1	Same as 9.1.12.1
9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.12.1	
9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.12.1	
9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.3 dB averaged over $BW_{Config}$$\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of cell 3 signal / AWGN
9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.1	Same as 9.1.14.1
9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.2	
9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel 12 and forward)	Same as 9.1.16.1	Same as 9.1.16.1
9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN

9.1.17.1 FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #10-15	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	N_{oc1} and N_{oc2} each ±1.0 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #10-15	Note: Noc1 is the AWGN on cell 1 frequency Ês1 / Noc1 is the ratio of cell 1 signal / AWGN Noc2 is the AWGN on cell 2 frequency Ês2 / Noc2 is the ratio of cell 2 signal / AWGN
9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #22-27 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #22-27 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	Same as 9.1.18.2	Same as 9.1.18.2
9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.18.1	Same as 9.1.18.1

9.1.19.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.18.2	Same as 9.1.18.2
9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	Same as 9.1.18.2	Same as 9.1.18.2
9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.20.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.21.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Same as 9.1.20.1	Same as 9.1.20.1
9.1.21.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	Same as 9.1.20.2	Same as 9.1.20.2

9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD	Noc1 ±1.0 dB averaged over BWConfig Noc1 ±1.3 dB over UE Measurement bandwidth Noc2 ±1.0 dB averaged over BWConfig Noc2 ±1.3 dB over UE Measurement bandwidth Ês1 / Noc1, Ês2 / Noc2, Ês3 / Noc2 each ±0.3 dB averaged over BWConfig Ês1 / Noc1, Ês2 / Noc2, Ês3 / Noc2 each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: Noc1 is the AWGN on frequency 1 Ês1 / Noc1 is the ratio of cell 1 signal / AWGN Noc2 is the AWGN on frequency 2 Ês2 / Noc2 is the ratio of cell 2 signal / AWGN Ês3 / Noc2 is the ratio of cell 3 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 TS = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD	Same as 9.1.22	Same as 9.1.22
9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $Ês_1$ / N_{oc1}, $Ês_2$ / N_{oc2} and $Ês_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $Ês_2$ / N_{oc2} and $Ês_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $Ês_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	Same as 9.1.24.1	Same as 9.1.24.1

9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	Same as 9.1.24.2	Same as 9.1.24.2
9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.1.1	Same as 9.1.1.1
9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.1.1	Same as 9.1.1.1
9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.27	Same as 9.1.27
9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 CRS $\hat{E}s_1$ / N_{oc} and CRS $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1$ / N_{oc} and CSI-RS $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} CRS $\hat{E}s_1$ / N_{oc} and CRS $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27 CSI-RS $\hat{E}s_1$ / N_{oc} and CSI-RS $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Same as 9.1.29	Same as 9.1.29

9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.32 TDD-TDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Same as 9.1.32	Same as 9.1.32
9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN
9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Same as 9.1.33	Same as 9.1.33
9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 CSI-RS $\hat{E}s_1$ / N_{oc1}, CSI-RS $\hat{E}s_2$ / N_{oc2}, and CSI-RS $\hat{E}s_3$ / N_{oc3} each ±0.3 dB averaged over BW_{Config} CSI-RS $\hat{E}s_1$ / N_{oc1}, CSI-RS $\hat{E}s_2$ / N_{oc2}, and CSI-RS $\hat{E}s_3$ / N_{oc3} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on frequency 1 CSI-RS $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 CSI-RS $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN CSI-RS $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN
9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Same as 9.1.35	Same as 9.1.35

9.1.37 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BW_{Config} N_{oc3} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2}, $\hat{E}s_3$ / N_{oc2}, $\hat{E}s_4$ / N_{oc3}, $\hat{E}s_5$ / N_{oc3} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2}, $\hat{E}s_3$ / N_{oc2}, $\hat{E}s_4$ / N_{oc3}, $\hat{E}s_5$ / N_{oc3} each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_4$ / N_{oc3} is the ratio of cell 4 signal / AWGN $\hat{E}s_5$ / N_{oc3} is the ratio of cell 5 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.1.38 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37
9.1.39 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37
9.1.39_1 3DL FDD RSRP for E-UTRAN in Carrier Aggregation (Rel-12 and forward)	Same as 9.1.37	Same as 9.1.37
9.1.40 3DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37
9.1.40_1 3DL TDD RSRP for E-UTRAN in Carrier Aggregation (Rel-12 and forward)	Same as 9.1.37	Same as 9.1.37
9.1.41.1 FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.1.1	Same as 9.1.1.1
9.1.41.2 FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.1.2	Same as 9.1.1.2
9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.1.1	Same as 9.1.1.1
9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.1.2	Same as 9.1.1.2
9.1.43.1 TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.1.1	Same as 9.1.1.1
9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.1.2	Same as 9.1.1.2
9.1.52 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.53 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52
9.1.54 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52

9.1.57 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc}, $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc}, $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.58 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57
9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Same as 9.2.1.1	Same as 9.2.1.1
9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN on frequency 2
9.2.3.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.1	
9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy	Same as 9.2.3.1	
9.2.4.2 TDD - TDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.1	
9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN on frequency 2
9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ	Same as 9.2.4A.1	

9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.5.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	
9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	
9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	
9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.2.7.1	Same as 9.2.7.1
9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.2.10.1 TDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 9.2.9.1	
9.2.11.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #47-52 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #47-52 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.2.11.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.11.1	
9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.11.1	
9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.11.1	
9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$, $\hat{E}s_2 / N_{oc}$ and $\hat{E}s_3 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc}$ is the ratio of cell 3 signal / AWGN
9.2.16.1 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.2.15.1	Same as 9.2.15.1
9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #10-15	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN on frequency 2
9.2.18.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy for 5MHz Bandwidth	Same as 9.2.18.1	
9.2.19.1 FDD-FDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS
9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS

9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #22-27 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	
9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	
9.2.22.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	
9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #10-15 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #10-15 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #10-15 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1
9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1
9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1

9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Same as 9.2.25.1	
9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Same as 9.2.25.1	
9.2.26.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Same as 9.2.25.1	
9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #47-52 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1}, $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.8 dB for PRBs #47-52 $\hat{E}s_2$ / N_{oc2} and $\hat{E}s_3$ / N_{oc2} each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN $\hat{E}s_3$ / N_{oc2} is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]

9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Same as 9.2.28	Same as 9.2.28
9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ and $\hat{E}s_2 / N_{oc2}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN on frequency 2
9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Same as 9.2.30	Same as 9.2.30
9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB for PRBs #22-27 N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$ and $\hat{E}s_3 / N_{oc2}$ each ±0.8 dB for PRBs #22-27 Time alignment error cell 2 rel. to cell 1: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Note: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN $\hat{E}s_3 / N_{oc2}$ is the ratio of cell 3 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	Same as 9.2.32	Same as 9.2.32

9.2.38 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1} ±1.0 dB averaged over BW_{Config} N_{oc1} ±1.3 dB over UE Measurement bandwidth N_{oc2} ±1.0 dB averaged over BW_{Config} N_{oc2} ±1.3 dB over UE Measurement bandwidth N_{oc3} ±1.0 dB averaged over BW_{Config} N_{oc3} ±1.3 dB over UE Measurement bandwidth $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$, $\hat{E}s_2 / N_{oc2}$, $\hat{E}s_3 / N_{oc3}$ each ±0.8 dB over UE Measurement bandwidth Time alignment errors: Intra-band contiguous CA: ±130 ns (±4Ts) Intra-band non-contiguous CA: ±260 ns (±8Ts) Inter-band CA: ±260 ns (±8Ts)	Notes: N_{oc1} is the AWGN on frequency 1 $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on frequency 2 $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN N_{oc3} is the AWGN on frequency 3 $\hat{E}s_3 / N_{oc3}$ is the ratio of cell 3 signal / AWGN UE Measurement bandwidth: 5MHz Ch BW: PRBs 10-15 10MHz Ch BW: PRBs 22-27 20MHz Ch BW: PRBs 47-52 T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
9.2.39 3DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.38	Same as 9.2.38
9.2.40 3DL FDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38
9.2.41 3DL TDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38
9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$ each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Same as 9.2.42.1	Same as 9.2.42.1
9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Same as 9.2.42.1	Same as 9.2.42.1
9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	<u>E-UTRA cell</u> N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} <u>UTRA cell</u> I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy	Same as 9.3.1	
9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	Same as 9.3.1	

9.4.1 E-UTRAN FDD – UTRA FDD CPICH Ec/No absolute accuracy	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
9.4.2 E-UTRAN TDD – UTRA FDD CPICH Ec/No absolute accuracy	Same as 9.4.1	Same as 9.4.1
9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	Same as 9.4.1	Same as 9.4.1
9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy	E-UTRA cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB PCCPCH E_C/I_{or} ±0.1 dB DwPCH_E_C/I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN PCCPCH E_c / I_{or} is the fraction of cell 2 power assigned to the PCCPCH Physical channel DwPCH_E_c / I_{or} is the fraction of cell 2 power assigned to the DwPCH channel
9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy	Same as 9.5.1	
9.6.1 GSM RSSI accuracy for E-UTRAN FDD	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} GSM cell BCCH1 Signal level ±0.7 dB GSM cell BCCH 2 to 6 Signal level ±2.0 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN GSM cells BCCH 1 to 6 have only the wanted signal, without AWGN
9.6.2 GSM RSSI accuracy for E-UTRAN TDD	E-UTRA Cell N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s$ / N_{oc} ±0.3 dB averaged over BW_{Config} GSM cell BCCH1 Signal level ±0.7 dB GSM cell BCCH 2 to 6 Signal level ±2.0 dB	Note: N_{oc} is the AWGN on cell 1 frequency $\hat{E}s$ / N_{oc} is the ratio of cell 1 signal / AWGN GSM cells BCCH 1 to 6 have only the wanted signal, without AWGN
9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN
9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.9.1.1	Same as 9.9.1.1

9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN
9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN
9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.9.2.1	Same as 9.9.2.1
9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	N_{oc} ±1.0 dB averaged over BW_{Config} N_{oc} ±1.3 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN
10.2 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	± 0.6dB	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	± 0.6dB	Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB
In addition, the following Test System uncertainties and related constraints apply. Any additional constraints are defined in the specific tests.		
AWGN Bandwidth		≥ 1.08MHz, 2.7MHz, 4.5MHz, 9MHz, 13.5MHz, 18MHz; N_{RB} x 180kHz according to BW_{Config}
AWGN absolute power uncertainty		Test-specific
AWGN flatness and signal flatness, max deviation for any Resource Block, relative to average over BW_{Config}		±2 dB
AWGN peak to average ratio		≥10 dB @0.001%

Signal-to noise ratio uncertainty	Test-specific
Fading profile power uncertainty	±0.5 dB
Fading profile delay uncertainty, relative to frame timing	±5 ns (excludes absolute errors related to baseband timing)

F.2 Interpretation of measurement results (normative)

See TS 36.521-1[10] Annex F2.

F.3 Test Tolerance and Derivation of Test Requirements (informative)

See TS 36.521-1[10] Annex F3.

F.3.1 Measurement of test environments

See TS 36.521-1[10] Annex F3.1.

F.3.2 Measurement of RRM requirements

Because the relationships between the Test system uncertainties and the Test Tolerances are often complex, it is not always possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 36 903 [20].

Table F.3.2-1: Derivation of Test Requirements (RRM tests)

Test	Minimum Requirement in TS 36.133	Test Tolerance (TT)	Test Requirement in TS 36.521-3
4.2.1 E-UTRA FDD – FDD cell re-selection intra frequency	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +16.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +13.00dB $\hat{E}s_2$ / N_{oc}: +16.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +16.00dB $\hat{E}s_2$ / N_{oc}: +13.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +16.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +13.00dB $\hat{E}s_2$ / N_{oc}: +16.45dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +16.45dB $\hat{E}s_2$ / N_{oc}: +13.00dB
4.2.2 E-UTRA TDD – TDD cell re-selection intra frequency	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.3 E-UTRA FDD - FDD cell re-selection inter frequency	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +14.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +12.00dB	During T0: -1.35dB +0.3dB -1.35dB +0.4dB During T1: -1.35dB +2.4dB -1.35dB +0.3dB During T2: -1.35dB +2.4dB -1.35dB 0dB During T3: -1.35dB +2.4dB -1.35dB +2.4dB	During T0: N_{oc1}: -99.35dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.70dB N_{oc2}: -99.35dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +14.40dB During T1: N_{oc1}: -99.35dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +16.40dB N_{oc2}: -99.35dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.70dB During T2: N_{oc1}: -99.35dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +16.40dB N_{oc2}: -99.35dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T3: N_{oc1}: -99.35dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +16.40dB N_{oc2}: -99.35dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +14.40dB
4.2.4 E-UTRA FDD - TDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3
4.2.5 E-UTRA TDD - FDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3
4.2.6 E-UTRA TDD - TDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3
4.2.7 E-UTRA FDD Inter frequency re-selection in the existence of non-allowed CSG cell	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13.00dB $\hat{E}s_3$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +8.00dB $\hat{E}s_3$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +8.00dB $\hat{E}s_3$ / N_{oc1}: +13.00dB N_{oc2}: -98dBm/15kHz	During T0: 0dB 0dB 0dB 0dB 0dB During T1: 0dB -0.2dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T0: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13.00dB $\hat{E}s_3$ / N_{oc1}: -infinitydB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.00dB During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +7.80dB $\hat{E}s_3$ / N_{oc1}: +8.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +8.00dB $\hat{E}s_3$ / N_{oc1}: +13.00dB N_{oc2}: -98dBm/15kHz

	$\hat{E}s_2$ / N_{oc2}: +13.00dB During T3: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13.00dB $\hat{E}s_3$ / N_{oc1}: +38.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +8.00dB	0dB During T3: 0dB 0dB 0dB 0dB 0dB	$\hat{E}s_2$ / N_{oc2}: +13.00dB During T3: N_{oc1}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13.00dB $\hat{E}s_3$ / N_{oc1}: +38.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +8.00dB
4.2.8 E-UTRA TDD Inter frequency re-selection in the existence of non-allowed CSG cell	Same as 4.2.7	Same as 4.2.7	Same as 4.2.7
4.2.9 E-UTRAN FDD - FDD intra frequency cell re-selection case for 5MHz bandwidth	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.12 E-UTRAN FDD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.13 E-UTRAN HD – FDD Intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.14 E-UTRA TDD - TDD intra frequency case for Cat-M1 UE in normal coverage	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.15 E-UTRAN FDD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -7.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -7.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -7.00dB $\hat{E}s_2$ / N_{oc}: -12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -7.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12.00dB $\hat{E}s_2$ / N_{oc}: -6.55dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -6.55dB $\hat{E}s_2$ / N_{oc}: -12.00dB
4.2.16 E-UTRAN HD - FDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.15	Same as 4.2.15	Same as 4.2.15
4.2.17 E-UTRAN TDD - TDD Intra frequency case for Cat-M1 UE in enhanced coverage	Same as 4.2.15	Same as 4.2.15	Same as 4.2.15
4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -∞dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T3: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +14.00dB UTRA Cell 2	During T1: 0dB +1.05dB -0.1dB 0dB 0dB During T2: 0dB +1.05dB -0.1dB +0.9dB 0dB During T3: 0dB +1.05dB	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +1.05dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -∞dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +1.05dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: +11.90dB CPICH_E_c/I_{or}: -10.00dB During T3: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz $\hat{E}s$ / N_{oc}: +1.05dB UTRA Cell 2

	I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB	-0.1dB -0.7dB 0dB	I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -5.70dB CPICH_E_c/I_{or}: -10.00dB
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +12.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB	During T1: -1.35dB +2.40dB 0dB +0.80dB 0dB During T2: -1.35dB +0.30dB 0dB +0.80dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.35dBm/15kHz Ês / N_{oc}: +14.40dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -99.35dBm/15kHz Ês / N_{oc}: -3.70dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB
4.3.1.3 EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is of lower priority	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB	During T1,T2 0dB 0dB 0dB +0.80dB 0dB During T3,T4 0dB 0dB 0dB +0.80dB 0dB	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.00dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_E_c/I_{or}: -10.00dB
4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz bandwidth	Same as 4.3.1.2		
4.3.2 E-UTRA FDD - UTRAN TDD cell re-selection	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +11.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: -3.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0.1dB 0dB 0dB 0dB 0dB During T2: 0dB 0.1dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +11.10dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: -3.1dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	Same as 4.3.1.2	Same as 4.3.1.2	Same as 4.3.1.2
4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of higher priority	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +11.00dB UTRA Cell 2	During T1: 0dB +0.1dB	During T1: N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +11.1dB

	Ioc: -80dBm/1.28MHz Îor / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm /15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Îor / Ioc: +11.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +11.00dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Îor / Ioc: -3.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB	0dB 0dB During T2: 0dB +0.1dB 0dB 0dB 0dB 0dB During T3: 0dB +0.1dB 0dB 0dB 0dB 0dB	I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -infinity During T2: N_{oc}: -98.0dBm /15kHz Ês / N_{oc}: +11.1dB I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +11.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_E_c/I_{or}: 0dB During T3: N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +11.1dB I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_E_c/I_{or}: 0dB
4.3.4.2 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of lower priority	Same as 4.3.2	Same as 4.3.2	Same as 4.3.2
4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: -3.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1, T2: 0dB 0dB 0dB 0dB 0dB 0dB During T3, T4: 0dB 0dB 0dB 0dB 0dB 0dB	During T1, T2: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: +22.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T3, T4: E-UTRA Cell 1 N_{oc}: -104.0dBm/15kHz Ês / N_{oc}: -3.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +13.0dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
4.4.1 E-UTRAN FDD - GSM cell re-selection	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +9.00dB GSM Cell 2 Signal level: -90.00dBm During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB GSM Cell 2 Signal level: -75.0dBm	During T1: -1.4dB +1.5dB 0dB During T2: -1.4dB +0.3dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.40dBm/15kHz Ês / N_{oc}: +10.5dB GSM Cell 2 Signal level: -90.00dBm During T2: E-UTRA Cell 1 N_{oc}: -99.40dBm/15kHz Ês / N_{oc}: -3.70dB GSM Cell 2 Signal level: -75.00dBm
4.4.2 E-UTRAN TDD - GSM cell re-selection	Same as 4.4.1	Same as 4.4.1	Same as 4.4.1
4.5.1.1 RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +9.00dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB	During T1 -1.4dB 1.5dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.4dBm/15kHz Ês / N_{oc}: +10.5dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB

	During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB	During T2 -1.4dB 0.3dB 0dB 0dB	During T2: E-UTRA Cell 1 N_{oc}: -99.4dBm/15kHz Ês / N_{oc}: -3.70dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB
4.5.2.1 E-UTRAN TDD - HRPD Cell Reselection: HRPD is of Lower Priority	Same as 4.5.1.1	Same as 4.5.1.1	Same as 4.5.1.1
5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +8.00dB $Ês_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +8.00dB $Ês_2$ / N_{oc}: +11.00dB During T3: N_{oc}: -98dBm /15kHz $Ês_1$ / N_{oc}: +8.00dB $Ês_2$ / N_{oc}: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +8.00dB $Ês_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +8.00dB $Ês_2$ / N_{oc}: +11.50dB During T3: N_{oc}: -98dBm /15kHz $Ês_1$ / N_{oc}: +8.00 $Ês_2$ / N_{oc}: +11.50dB
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	During T1: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: +7.0dB During T3: N_{oc1}: -98dBm /15kHz $Ês_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: +7.0dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB +0.5dB During T3: 0dB 0dB 0dB +0.5dB	During T1: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: +7.50dB During T3: N_{oc1}: -98dBm /15kHz $Ês_1$ / N_{oc1}: +4dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: +7.50dB
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.5 E-UTRAN FDD-FDD inter-frequency Handover with unknown target cell	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.0dB
5.1.6 E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +5.0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +5.0dB

5.1.7 E-UTRAN FDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.8 E-UTRAN TDD-FDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz bandwidth	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.10 E-UTRAN FDD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.11 E-UTRAN HD-FDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.12 E-UTRAN TDD-TDD Handover intra frequency handover for UE category 0	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.13 E-UTRAN FDD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	During T1: N$_{oc}$: -98dBm/15kHz Ês$_1$ / N$_{oc}$: +8.00dB Ês$_2$ / N$_{oc}$: -infinity During T2: N$_{oc}$: -98dBm/15kHz Ês$_1$ / N$_{oc}$: +8.00dB Ês$_2$ / N$_{oc}$: +12.00dB During T3: N$_{oc}$: -98dBm /15kHz Ês$_1$ / N$_{oc}$: +8.00dB Ês$_2$ / N$_{oc}$: +12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	During T1: N$_{oc}$: -98dBm/15kHz Ês$_1$ / N$_{oc}$: +8.00dB Ês$_2$ / N$_{oc}$: -infinity During T2: N$_{oc}$: -98dBm/15kHz Ês$_1$ / N$_{oc}$: +8.00dB Ês$_2$ / N$_{oc}$: +12.50dB During T3: N$_{oc}$: -98dBm /15kHz Ês$_1$ / N$_{oc}$: +8.00dB Ês$_2$ / N$_{oc}$: +12.50dB
5.1.14 E-UTRAN HD-FDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.13	Same as 5.1.13	Same as 5.1.13
5.1.15 E-UTRAN TDD Intra frequency handover for Cat-M1 UEs in CEModeA	Same as 5.1.13	Same as 5.1.13	Same as 5.1.13
5.2.1 E-UTRAN FDD - UTRAN FDD handover	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB During T3: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB	During T1: 0dB -1.10dB 0dB - During T2: 0dB -1.10dB 0dB 0dB During T3: 0dB -1.10dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: -1.10dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: -1.10dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB During T3: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: -1.10dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc:-1.80dB
5.2.2 E-UTRAN TDD - UTRAN FDD handover	Same as 5.2.1	Same as 5.2.1	Same as 5.2.1
5.2.3 E-UTRAN FDD - GSM handover	During T1: E-UTRA Cell 1 N$_{oc}$: -98dBm/15kHz Ês / N$_{oc}$: +4dB GSM Cell 2 Signal level: -85dBm	During T1: 0dB 0dB 0dB	During T1: E-UTRAN Cell 1 N$_{oc}$: -98dBm/15kHz Ês / N$_{oc}$: +4dB GSM Cell 2 Signal level: -85dBm

	During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm During T3: E-UTRA Cell 1 N_{oc}: -98dBm /15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm	During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm During T3: E-UTRA Cell 1 N_{oc}: -98dBm /15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -75dBm
5.2.4 E-UTRA TDD – UTRA TDD handover	During T1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: +13.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 11.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: -3.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 11.00dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB	During T1: -1.05dB 2.1dB -0.8dB 0dB 0dB 0dB During T2: -1.05dB 0dB -0.8dB 1.6dB 0dB 0dB During T3: -1.05dB 0dB -0.8dB +1.6dB 0dB 0dB	During T1: N_{oc}: -99.05dBm/15kHz Ês / N_{oc}: +15.1dB I_{oc}: -80.8dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -3.0dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T2: N_{oc}: -99.05dBm/15kHz Ês / N_{oc}: -3.0dB I_{oc}: -80.8dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 12.6dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB During T3: N_{oc}: -99.05dBm/15kHz Ês / N_{oc}: -3.0dB I_{oc}: -80.8dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: 12.6dB PCCPCH_Ec/Ior: -3dB DwPCH_Ec/Ior: 0dB
5.2.5 E-UTRA FDD – UTRA TDD handover	Same as 5.2.4	Same as 5.2.4	Same as 5.2.4
5.2.6 E-UTRA TDD - GSM handover	Same as 5.2.3	Same as 5.2.3	Same as 5.2.3
5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity	During T1: 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity

	During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	During T2: 0dB 0dB 0dB	During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
5.2.9 E-UTRAN TDD – GSM handover: unknown target cell	Same as 5.2.8	Same as 5.2.8	Same as 5.2.8
5.2.10 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: 13 dB PCCPCH_E_c/I_{or}: -3.00dB DwPCH_E_c/I_{or}: 0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 3dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: 13 dB PCCPCH_E_c/I_{or}: -3.00dB DwPCH_E_c/I_{or}: 0dB
5.2.11 E-UTRAN FDD – UTRAN FDD Handover for 5MHz Bandwidth	Same as 5.2.1	Same as 5.2.1	Same as 5.2.1
5.3.1 RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	During T1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 0dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: -infinity During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 0dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB During T3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: 0dB HRPD Cell 2 I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB	During T1: 0dB -0.8dB 0dB During T2: 0dB -0.8dB 0dB 0dB During T3: 0dB -0.8dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: -0.8dB I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: -0.8dB I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}_s$ / N_{oc}: -0.8dB I_{oc}: -55.00dBm/1.2288MHz I_{or} / I_{oc}: 0 dB
5.3.5 E-UTRAN TDD - HRPD handover	Same as 5.3.1	Same as 5.3.1	Same as 5.3.1
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +7.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -infinity $\hat{E}s_2$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -infinity	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +7.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: -infinity $\hat{E}s_2$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: -infinity

	$\hat{E}s_2 / N_{oc}$: +4.00dB	0dB	$\hat{E}s_2 / N_{oc}$: +4.00dB
6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: -infinity N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB
6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment	Same as 6.1.3	Same as 6.1.3	Same as 6.1.3
6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.8 E-UTRAN TDD Intra-frequency RRC Re-establishment for UE category 0	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.9 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.10 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.11 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeA	Same as 6.1.1	Same as 6.1.1	Same as 6.1.1
6.1.12 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +7.00dB $\hat{E}s_2 / N_{oc}$: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -15.00dB $\hat{E}s_2 / N_{oc}$: -12.00dB During T3: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -infinity $\hat{E}s_2 / N_{oc}$: -12.00dB During T4: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: -infinity $\hat{E}s_2 / N_{oc}$: -12.00dB	During T1: 0dB 0dB 0dB During T2: 0dB +0.6dB 0dB During T3: 0dB 0dB 0dB During T4: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +7.00dB $\hat{E}s_2 / N_{oc}$: +4.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -14.40dB $\hat{E}s_2 / N_{oc}$: -12.00dB During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: -infinity $\hat{E}s_2 / N_{oc}$: +4.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: -infinity $\hat{E}s_2 / N_{oc}$: -12.00dB

6.1.13 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.12	Same as 6.1.12	Same as 6.1.12
6.1.14 E-UTRAN TDD Intra-frequency RRC Re-establishment for Cat-M1 UE in CEModeB	Same as 6.1.12	Same as 6.1.12	Same as 6.1.12
6.2.1 E-UTRAN FDD - Contention Based Random Access Test	Test 1 and Test 2 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Uplink timing T_e: ±12T_s	 1.5dB 1.5dB 0.7dB 0.7dB 3T_s	Test 1 and Test 2 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing T_e: ±15T_s
6.2.2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.3 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.4 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.5 E-UTRAN FDD – Contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.6 E-UTRAN FDD – Non-contention Based Random Access Test for 5MHz bandwidth	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.7 E-UTRAN FDD – Non-Contention Based Random Access Test for SCell in sTAG	Test 1, Test 2 and Test 3 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Uplink timing T_e: ±12T_s	 1.5dB 1.5dB 0.7dB 0.7dB 3T_s	Test 1, Test 2 and Test 3 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing T_e: ±15T_s
6.2.8 E-UTRAN TDD – Non-Contention Based Random Access Test for SCell in sTAG	Same as 6.2.7	Same as 6.2.7	Same as 6.2.7
6.2.12 E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.13 E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Test 1 and Test 2 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Timing Te: ±48Ts rsrp-ThresholdsPrach FFS	 1.5dB 1.5dB 0.7dB 0.7dB 3Ts	Test 1 and Test 2 Absolute uplink power: Normal conditions ±10.5dB Extreme conditions ±13.5dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing Te: ±51Ts rsrp-ThresholdsPrach FFS
6.2.14 E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	Same as 6.2.13	Same as 6.2.13	Same as 6.2.13
6.2.15 E-UTRAN TDD Contention Based Random	Same as 6.2.13	Same as 6.2.13	Same as 6.2.13

Access Test for Cat-M1 UEs in Enhanced Coverage			
6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.02 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.4dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.42dB
6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	During T1: 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +8.0dB PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.00dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 N_{oc}: -98.0dBm/15kHz Ês / N_{oc}: +4.0dB UTRA Cell 2 I_{oc}: -80.0dBm/1.28MHz $\hat{I}_{or}$ / I_{oc}: +8.0dB PCCPCH_E_c/I_{or}: -4.77dB DwPCH_Ec/Ior: 0dB
6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	Same as 6.3.5	Same as 6.3.5	Same as 6.3.5
6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
6.3.10 Redirection from E-UTRAN FDD to GERAN when	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3

System Information is not provided			
6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	Same as 6.3.3	Same as 6.3.3	Same as 6.3.3
6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	Same as 6.3.1	Same as 6.3.1	Same as 6.3.1
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy	Test 1 (10MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 (10MHz Ch BW): Uplink timing: ±12T_s Ês / N_{oc}: +3.00dB Test 3: (1.4MHz Ch BW) Uplink timing: ±24T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 4.0T Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 (10MHz Ch BW): Uplink timing: ±15T_s Ês / N_{oc}: +3.30dB Test 3: (1.4MHz Ch BW) Uplink timing: ±27T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s Ês / N_{oc}: +3.30dB
7.1.1_1 E-UTRAN FDD - UE Transmit Timing Accuracy (Non DRx UE)	Test 1 (10MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 not applicable Test 3: (1.4MHz Ch BW) Uplink timing: ±24T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 not applicable Test 3: (1.4MHz Ch BW) Uplink timing: ±27T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s Ês / N_{oc}: +3.30dB
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy	Test 1 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Ês / N_{oc}: +3.00dB Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±24) x T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s Ês / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.3dB ±3T_s +0.5T_s +1.1T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Ês / N_{oc}: +3.30dB Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±27) x T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s Ês / N_{oc}: +3.30dB
7.1.2_1 E-UTRAN TDD - UE Transmit Timing Accuracy (Non DRx UE)	Test 1 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s Ês / N_{oc}: +3.00dB Test 2 not applicable Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±24) x T_s Max step size T_q: 17.5T_s Max adjust rate: 17.5T_s	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB ±3T_s +0.5T_s +1.1T_s	Test 1 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s Ês / N_{oc}: +3.30dB Test 2 not applicable Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±27) x T_s Max step size T_q: 18T_s Max adjust rate: 18.6T_s

	$\hat{E}s$ / N_{oc}: +3.00dB	+0.3dB	$\hat{E}s$ / N_{oc}: +3.30dB
7.1.3 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell	Test 1: Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2: Uplink timing: ±12T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: ±15T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2: Uplink timing: ±15T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.3_1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Test 1: Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2 and Test 3: Uplink timing: ±12T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: ±15T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2 and Test 3: Uplink timing: ±15T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.4 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell	Test 1: Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2: Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2: Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.4_1 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell (Release 12 and forward)	Test 1: Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2 and Test: Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: (624 ±15) x T_s Max step size T_q: 4T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2 and Test 3: Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.4A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell for 20 MHz +10 MHz bandwidth	Same as 7.1.4	Same as 7.1.4	Same as 7.1.4
7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	Test 1 (5MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 5.5T_s Min adjust rate: 11T_s in 1.57s Max adjust rate: 5.5T_s $\hat{E}s$ / N_{oc}: +3.00dB	 ±3T_s +0.5T_s -5.3T_s +1.1T_s +0.3dB	Test 1 (5MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 6.0T_s Min adjust rate: 5.7T_s in 1.57s Max adjust rate: 6.6T_s $\hat{E}s$ / N_{oc}: +3.30dB
7.1.6 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	Test 1: Uplink timing: ±12T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s	 ±3T_s +0.5T_s -3.6T_s +1.1T_s	Test 1: Uplink timing: ±15T_s Max step size T_q: 4.0T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s

	$\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2: Uplink timing: ±12T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	+0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	$\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2: Uplink timing: ±15T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.7 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG	Test 1: Uplink timing: (624 ±12) x T_s Max step size T_q: 3.5T_s Min adjust rate: 7T_s Max adjust rate: 3.5T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB Test 2: Uplink timing: (624 ±12) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.00dB $\hat{E}_{s2}$ / N_{oc2}: +3.00dB	 ±3T_s +0.5T_s -3.6T_s +1.1T_s +0.3dB +0.3dB ±3T_s +0.3dB +0.3dB	Test 1: Uplink timing: (624 ±15) x T_s Max step size T_q: 4.0T_s Min adjust rate: 3.4T_s Max adjust rate: 4.6T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB Test 2: Uplink timing: (624 ±15) x T_s $\hat{E}_{s1}$ / N_{oc1}: +3.30dB $\hat{E}_{s2}$ / N_{oc2}: +3.30dB
7.1.7A E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +20MHz bandwidth	Sams as 7.1.7	Sams as 7.1.7	Sams as 7.1.7
7.1.7B E-UTRAN TDD – UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz +10MHz bandwidth	Sams as 7.1.7	Sams as 7.1.7	Sams as 7.1.7
7.1.10 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.11 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.12 E-UTRAN TDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeA	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2	Test 1: Same as 7.1.1 Test 1 Test 2 & 3: Same as 7.1.1 Test 2
7.1.14 E-UTRAN FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	FFS	FFS	FFS
7.1.15 E-UTRAN HD-FDD – UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	FFS	FFS	FFS
7.1.16 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for Cat-M1 UE in CEModeB	FFS	FFS	FFS
7.2.1 E-UTRAN FDD - UE Timing Advanced Adjustment Accuracy	Timing Advance Adjustment: ±4T_s	 0.5T_s	Timing Advance Adjustment: ±4.5T_s
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1

Bandwidth			
7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.5A E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +20MHz bandwidth	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.5B E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for SCell in sTAG for 20MHz +10MHz bandwidth	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.6 E-UTRAN FDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.7 E-UTRAN HD-FDD UE Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.2.8 E-UTRAN TDD Timing Advance Adjustment Accuracy Test for Cat-M1 UE in CEModeA	Same as 7.2.1	Same as 7.2.1	Same as 7.2.1
7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	SNRs as specified	0.6dB (Subtests 1&2) 0.8dB (Subtest 3) 0.9dB (Subtest 4)	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync	SNRs as specified	0.8dB (Subtest 1) 0.9dB (Subtest 2)	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT During T4: Formula: SNR - TT During T5: Formula: SNR + TT
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync	SNRs as specified	Same as 7.3.2	Same as 7.3.2
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	SNRs as specified	0.9dB (Subtest 1) 0.6dB (Subtest 2)	Same as 7.3.1
7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	SNRs as specified	0.6dB	Same as 7.3.2
7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	SNRs as specified	0.9dB (Subtest 1) 0.6dB (Subtest 2)	Same as 7.3.1
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	SNRs as specified	0.6dB	Same as 7.3.2
7.3.9 E-UTRAN FDD Radio Link	SNRs as specified	0.9dB for cell 1	During T1:

Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)		(TT1) 0.2dB for cell 2 (TT2)	Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.10 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9	Same as 7.3.9
7.3.11 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2(TT2)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 During T4: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 During T5: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.12 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11	Same as 7.3.11
7.3.13 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9	Same as 7.3.9
7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.9	Same as 7.3.9	Same as 7.3.9
7.3.15 E-UTRAN FDD Radio Link Monitoring Test for In-sync	Same as 7.3.11	Same as 7.3.11	Same as 7.3.11

under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)			
7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Same as 7.3.11	Same as 7.3.11	Same as 7.3.11
7.3.17 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2 (TT2) 0.2dB for cell 3 (TT3)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Cell 3 Formula: SNR + TT3 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty) TT3: ($\hat{E}s_3/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.18 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.17	Same as 7.3.17	Same as 7.3.17
7.3.19 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	SNRs as specified	0.9dB for cell 1 (TT1) 0.2dB for cell 2(TT2) 0.2dB for cell 3 (TT3)	During T1: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T2: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 During T3: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Cell 3 Formula: SNR + TT3 During T4: Cell 1 Formula: SNR - TT1 Cell 2 Formula: SNR + TT2 Cell 3 Formula: SNR + TT3 During T5: Cell 1 Formula: SNR + TT1 Cell 2 Formula: SNR - TT2 Cell 3 Formula: SNR - TT3 Formuale for Test Tolerance values: TT1: $\hat{E}s_1/N_{oc}$ uncertainty TT2: ($\hat{E}s_2/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)

			TT3: ($\hat{E}s_3/\hat{E}s_1$ uncertainty - $\hat{E}s_1/N_{oc}$ uncertainty)
7.3.20 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non MBSFN ABS (feICIC)	Same as 7.3.19	Same as 7.3.19	Same as 7.3.19
7.3.21 E-UTRAN FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.19	Same as 7.3.19	Same as 7.3.19
7.3.22 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	Same as 7.3.19	Same as 7.3.19	Same as 7.3.19
7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	SNRs as specified	0.9dB	Same as 7.3.2
7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	SNRs as specified	0.6dB	Same as 7.3.2
7.3.26 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	SNRs as specified	0.9dB	Same as 7.3.1
7.3.27 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.28 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	SNRs as specified	0.6dB	Same as 7.3.1
7.3.29 E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.30 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.31 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.32 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.1
7.3.33 E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.2
7.3.34 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.1
7.3.35 E-UTRAN TDD Radio Link Monitoring Test for In-sync for UE category 0	SNRs as specified	Same as 7.3.26	Same as 7.3.2
7.3.36 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category 0	SNRs as specified	Same as 7.3.28	Same as 7.3.1
7.3.37 E-UTRAN TDD Radio Link Monitoring Test for In-sync	SNRs as specified	Same as 7.3.28	Same as 7.3.2

in DRX for UE category 0			
7.3.38 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	SNRs as specified	0.9dB	Same as 7.3.1
7.3.39 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for Out-of-sync in DRX in asynchronous DC	SNRs as specified	0.9dB	Same as 7.3.1
7.3.40 E-UTRAN TDD-TDD DC Radio Link Monitoring Test for Out-of-sync in DRX in synchronous DC	SNRs as specified	0.9dB	Same as 7.3.1
7.3.41 E-UTRAN FDD-FDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	SNRs as specified	0.6dB	Same as 7.3.2
7.3.42 E-UTRAN FDD-FDD DC Radio Link Monitoring Test for In-sync in DRX in asynchronous DC	SNRs as specified	0.6dB	Same as 7.3.2
7.3.43 E-UTRAN TDD-TDD Radio Link Monitoring Test for In-sync in DRX in synchronous dual connectivity	SNRs as specified	0.6dB	Same as 7.3.2
7.3.48 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.1
7.3.49 E-UTRAN FD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.2
7.3.50: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.1
7.3.51 E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.2
7.3.52 E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.1
7.3.53 E-UTRAN HD-FDD Radio Link Monitoring Test for In-Sync for Cat-M1 UE in CEMode A	SNRs as specified	0.9dB	Same as 7.3.2
7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.1
7.3.55: E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	SNRs as specified	0.6dB	Same as 7.3.2
7.5.1 E-UTRAN FDD – UE ProSe Direct Discovery Transmission Timing Accuracy Test	Uplink timing: ±12T_s Ês / N_{oc}: +3.00dB	±3T_s +0.3dB	Uplink timing: ±15T_s Ês / N_{oc}: +3.30dB
7.5.4 E-UTRAN FDD – UE ProSe Direct Communication Transmission Timing Accuracy Test	Uplink timing: ±12T_s Ês / N_{oc}: +3.00dB	±3T_s +0.3dB	Uplink timing: ±15T_s Ês / N_{oc}: +3.30dB
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +4.00dB $Ês_2$ / N_{oc}: -infinity During T2:	During T1: 0dB 2.10dB 0dB During T2:	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +6.10dB $Ês_2$ / N_{oc}: -infinity During T2:

	N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: +4.00dB	0dB 2.10dB 2.10dB	N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.10dB $\hat{E}s_2 / N_{oc}$: +6.10dB
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB
8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.1.5	Same as 8.1.5	Same as 8.1.5
8.1.7 UE Measurement Procedures / E-UTRAN FDD-FDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +1.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +1.00dB $\hat{E}s_2 / N_{oc}$: -4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0.8dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +1.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +1.00dB $\hat{E}s_2 / N_{oc}$: -3.20dB
8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	During T1: Noc: -98dBm/15kHz Ês1 / Noc: +4.00dB Ês2 / Noc: +2.00dB Ês3 / Noc: -infinity During T2: Noc: -98dBm/15kHz Ês1 / Noc: +4.00dB Ês2 / Noc: +2.00dB Ês3 / Noc: -4.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.8dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: +2.00dB $\hat{E}s_3 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_1 / N_{oc}$: +2.00dB $\hat{E}s_2 / N_{oc}$: -3.20dB
8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz Bandwidth	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz Bandwidth	Same as 8.1.3	Same as 8.1.3	Same as 8.1.3
8.1.11 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1} / N_{oc}$: +4.00dB $\hat{E}_{s2} / N_{oc}$: -infinity	During T1: 0dB 2.10dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1} / N_{oc}$: +6.10dB $\hat{E}_{s2} / N_{oc}$: -infinity

category 0	During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB	During T2: 0dB 2.10dB 2.10dB	During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.10dB $\hat{E}_{s2}$ / N_{oc}: +6.10dB
8.1.12 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	Same as 8.1.11	Same as 8.1.11	Same as 8.1.11
8.1.13 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.11	Same as 8.1.11	Same as 8.1.11
8.1.17 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: +4.00dB	During T1: 0dB 2.60dB 0dB During T2: 0dB 2.60dB 2.60dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.60dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +6.60dB $\hat{E}_{s2}$ / N_{oc}: +6.60dB
8.1.18 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	Same as 8.1.17	Same as 8.1.17	Same as 8.1.17
8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: +11.00dB
8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.22 E-UTRAN HD- FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.1.23 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: +4.00dB

	$\hat{E}_{s2}$ / N_{oc}: +4.00dB	0.2dB	$\hat{E}_{s2}$ / N_{oc}: +4.20dB
8.1.24 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.25 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.29 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.30 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	Same as 8.1.23	Same as 8.1.23	Same as 8.1.23
8.1.33 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.00dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -12.00dB $\hat{E}_{s2}$ / N_{oc}: -12.00dB	During T1: 0dB 0.8dB 0dB During T2: 0dB 1.2dB 1.2dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -11.20dB $\hat{E}_{s2}$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}_{s1}$ / N_{oc}: -10.80dB $\hat{E}_{s2}$ / N_{oc}: -10.80dB
8.1.34 E-UTRAN HD-FDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33	Same as 8.1.33
8.1.35 E-UTRAN TDD Intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	Same as 8.1.33	Same as 8.1.33	Same as 8.1.33
8.2.1 E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB	During T1: 0dB 2.10dB 0dB During T2: 0dB 2.60dB 2.60dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.10dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.60dB $\hat{E}s_2$ / N_{oc}: +6.60dB
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.2.1	Same as 8.2.1	Same as 8.2.1
8.2.3 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +8.00dB

	$\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB	0dB During T3: 0dB 0dB 0dB	$\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB
8.2.4 E-UTRAN TDD-TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.2.3	Same as 8.2.3	Same as 8.2.3
8.2.5 UE Measurement Procedures / E-UTRAN TDD-TDD Intra-frequency event-triggered reporting under time domain measurement resource restriction with non-MBSFN ABS (eICIC)	Same as 8.1.7	Same as 8.1.7	Same as 8.1.7
8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 8.1.8	Same as 8.1.8	Same as 8.1.8
8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	Same as 8.1.19	Same as 8.1.19	Same as 8.1.19
8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.7dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.70dB
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1	Same as 8.3.1
8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +24.00dB	During T1: +2.5dB 0dB 0dB 0dB During T2: +2.5dB -4.0dB 0dB 0dB	During T1: N_{oc1}: -95.50dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +4.00dB During T2: N_{oc1}: -95.50dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +0.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +24.00dB
8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2:	During T1: 0dB 0dB 0dB 0dB During T2:	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2:

	N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB
8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.3.4	Same as 8.3.4	Same as 8.3.4
8.3.6 E-UTRAN FDD-FDD Inter-frequency event triggered reporting without measurement gaps under AWGN propagation conditions in asynchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB
8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.7dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.70dB
8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used	Same as 8.3.3	Same as 8.3.3	Same as 8.3.3
8.4.4 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB
8.4.5 E-UTRAN TDD-TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	Same as 8.4.4	Same as 8.4.4	Same as 8.4.4

8.5.1 E-UTRAN FDD – UTRAN FDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
8.5.2 E-UTRAN FDD – UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -3.35 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.4dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -2.95dB
8.5.3 E-UTRAN FDD – UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Same as 8.5.1	Same as 8.5.1	Same as 8.5.1
8.5.4 E-UTRAN FDD – UTRAN FDD enhanced cell identification under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.02 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: 0.02dB
8.5.6 E-UTRAN FDD - UTRAN FDD event triggered reporting without measurement gaps under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz Bandwidth	Same as 8.5.1	Same as 8.5.1	Same as 8.5.1

8.6.1 E-UTRAN TDD -UTRAN FDD event triggered reporting under fading propagation conditions	Same as 8.5.1	Same as 8.5.1	Same as 8.5.1
8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: +9dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB -0.40dB 0dB 0dB 0dB During T2: 0dB 0dB -0.40dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80.40dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -80.40dBm/1.28MHz I_{or} / I_{oc}: +9dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: -inf PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 I_{oc}: -75dBm/1.28MHz I_{or} / I_{oc}: +5dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: - infinity	During T1: 0dB 0dB +0.6dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -79.4dBm/1.28MHz Ior / Ioc: - infinity

	PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -80dBm/1.28MHz Ior / Ioc: +8dB PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB	0dB 0dB During T2: 0dB 0dB +0.6dB 0dB 0dB 0dB	PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB UTRA Cell 2 Ioc: -79.4dBm/1.28MHz Ior / Ioc: +8dB PCCPCH_Ec/Ior: -4.77dB DwPCH_Ec/Ior: 0dB
8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
8.8.2 E-UTRAN FDD- GSM event triggered reporting when DRX is used in AWGN	During T1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -75dBm	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRAN Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4.00dB GSM Cell 2 Signal level: -75dBm
8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: 9 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0 dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Iot: 4dB UTRA Cell 2 Ioc: -70dBm/1.28MHz Ior / Ioc: 9 dB
8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	Same as 8.7.4	Same as 8.7.4	Same as 8.7.4
8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN	Same as 8.8.1	Same as 8.8.1	Same as 8.8.1
8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN	Same as 8.8.2	Same as 8.8.2	Same as 8.8.2
8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2	During T1: 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2

	Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 3dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 3dB	0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB +0.6dB 0dB +0.6dB	Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 3.6dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 3.6dB
8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Same as 8.11.1	Same as 8.11.1	Same as 8.11.1
8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB -1.05dB 0dB 0dB 0dB 0dB During T2: 0dB -1.05dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB
8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: 9.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB -1.05dB 0dB 0dB -0.4dB 0dB 0dB 0dB During T2: 0dB -1.05dB 0dB 0dB -0.4dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity UTRA Cell 3 I_{oc}: -80.4dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +2.95dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB UTRA Cell 3 I_{oc}: -80.4dBm/1.28MHz I_{or} / I_{oc}: 9.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.11.5 Combined E-UTRAN FDD	During T1:	During T1:	During T1:

- E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity GSM Cell 3 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.00dB GSM Cell 3 Signal level: -75dBm	 0dB -0.2dB 0dB 0dB 0dB During T2: 0dB -0.2dB 0dB +0.5dB 0dB	E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +3.80dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity GSM Cell 3 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +3.80dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: +7.50dB GSM Cell 3 Signal level: -75dBm
8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Same as 8.11.5	Same as 8.11.5	Same as 8.11.5
8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1	Same as 8.3.1
8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1	Same as 8.3.1
8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4	Same as 8.4.4
8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1
8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	Same as 8.4.4	Same as 8.4.4	Same as 8.4.4
8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $Ês_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $Ês_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $Ês_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $Ês_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $Ês_2$ / N_{oc2}: 19dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $Ês_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $Ês_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $Ês_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $Ês_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $Ês_2$ / N_{oc2}: 19.2dB

	E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: -3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: -3dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -3dB	 0dB During T3: 0dB 0dB 0dB -0.2dB 0dB	E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: -3.0dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: -3.2dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -3.0dB
8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX	Same as 8.16.1	Same as 8.16.1	Same as 8.16.1
8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: 16dB	During T1: 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -98dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -98dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: 16dB
8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: -3dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -3dB	During T1: 0dB +0.2dB -0.1dB +0.3dB 0dB During T2: 0dB +0.2dB -0.1dB +0.3dB 0dB During T3: 0dB 0dB -0.1dB -0.1dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -104.1dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 19.3dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -104.1dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: 19.3dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}_{s1} / N_{oc1}$: -3.0dB E-UTRA Cell 2 N_{oc2}: -104.1dBm/15kHz $\hat{E}_{s2} / N_{oc2}$: -3.1dB E-UTRA Cell 3 $\hat{E}_{s3} / N_{oc2}$: -3.0dB
8.16.6 E-UTRAN TDD event	Same as 8.16.5	Same as 8.16.5	Same as 8.16.5

triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth			
8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: 16dB	During T1: 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: 16dB
8.16.8 E-UTRAN TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	Same as 8.16.7	Same as 8.16.7	Same as 8.16.7
8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -3dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -3dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19.2dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19.2dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -3.0dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -3.0dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -3.0dB
8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	Same as 8.16.9	Same as 8.16.9	Same as 8.16.9
8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.12 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3

interruption in non-DRX for 10MHz+5MHz			
8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -3dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -3dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -3dB	During T1: 0dB +0.2dB 0dB +0.2dB 0dB During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19.2dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19.2dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -3.0dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -3.0dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -3.0dB
8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	Same as 8.16.13	Same as 8.16.13	Same as 8.16.13
8.16.15 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.16 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 5MHz+5MHz	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.17 E-UTRAN FDD activation and deactivation of known SCell in non-DRX	Same as 8.16.37	Same as 8.16.37	Same as 8.16.37
8.16.17A E-UTRAN FDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.18 E-UTRAN TDD activation and deactivation of known SCell in non-DRX	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.18A E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz	Same as 8.16.17	Same as 8.16.17	Same as 8.16.17
8.16.21 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz bandwidth	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity	During T1: 0dB +0.2dB 0dB +0.2dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 19.2dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 19.2dB E-UTRA Cell 3 $\hat{E}s_3 / N_{oc2}$: -infinity

	During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	During T2: 0dB +0.2dB 0dB +0.2dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 19.2dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 19.2dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 19.0dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.0dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.22 E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	Same as 8.16.3	Same as 8.16.3	Same as 8.16.3
8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3dB	During T1: 0dB +0.2dB -0.5dB +0.7dB 0dB During T2: 0dB +0.2dB -0.5dB +0.7dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17.2dB E-UTRA Cell 2 N_{oc2}: -104.5dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.7dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17.2dB E-UTRA Cell 2 N_{oc2}: -104.5dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.7dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 17.0dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3.0dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.0dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -3.0dB
8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	Same as 8.16.23	Same as 8.16.23	Same as 8.16.23
8.16.25 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity	During T1: 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: -infinity

	During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB	During T2: 0dB 0dB 0dB 0dB 0dB	During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 16dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 16dB
8.16.26 E-UTRAN TDD-FDD CA Event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in TDD	Same as 8.16.25	Same as 8.16.25	Same as 8.16.25
8.16.27 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -3dB	During T1: 0dB 0dB 0dB 0dB -0.5dB +0.7dB 0dB During T2: 0dB 0dB 0dB +0.2dB -0.5dB +0.7dB 0dB During T3: 0dB 0dB 0dB -0.2dB -0.5dB -0.7dB -0.7dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104.5dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.7dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17.2dB E-UTRA Cell 3 N_{oc3}: -104.5dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17.7dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: 17dB During T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -3dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -3.2dB E-UTRA Cell 3 N_{oc3}: -104.5dBm/15kHz $\hat{E}s_3$ / N_{oc3}: -3.7dB E-UTRA Cell 4 $\hat{E}s_4$ / N_{oc3}: -3.7dB
8.16.28 E-UTRAN TDD-FDD 3DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX with PCell in TDD	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27
8.16.29 3DL FDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27
8.16.30 3DL TDD CA Event Triggered Reporting under Deactivated SCells in Non-DRX	Same as 8.16.27	Same as 8.16.27	Same as 8.16.27
8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2	During T1: 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 16dB E-UTRA Cell 2

with PCell in FDD	N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: 16dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$:16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: -infinity During T4: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: 16dB	0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16 E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: 16dB During T3: E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: -infinity E-UTRA Cell 1 N_{oc1}: -101dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 16dB E-UTRA Cell 2 N_{oc2}: -101dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 16dB E-UTRA Cell 3 N_{oc3}: -101dBm/15kHz $\hat{E}s_3 / N_{oc3}$: 16dB E-UTRA Cell 4 $\hat{E}s_4 / N_{oc3}$: 16dB
8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31
8.16.33 E-UTRAN FDD 3DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31
8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	Same as 8.16.31	Same as 8.16.31	Same as 8.16.31
8.16.35 3 DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 17dB	During T1,T2,T3: 0dB 0dB 0dB 0dB	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2 / N_{oc2}$: 17dB

	E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB	 0dB 0dB	E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB
8.16.36 3 DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35
8.16.37 3DL FDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35
8.16.38 3DL TDD CA Activation and Deactivation of known SCell in non-DRX	Same as 8.16.35	Same as 8.16.35	Same as 8.16.35
8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB During T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2, T3: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB During T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB
8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39
8.16.41 3 DL FDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39
8.16.42 3 DL TDD CA activation and deactivation of unknown SCell in non-DRX	Same as 8.16.39	Same as 8.16.39	Same as 8.16.39
8.16.57 4DL FDD CA Activation and Deactivation of Known SCell in Non-DRX	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB	During T1,T2,T3: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	During T1, T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB
8.16.58 4DL TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57
8.16.59 4DL PCell in FDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57
8.16.60 4DL PCell in TDD CA Activation and Deactivation of Known SCell in Non-DRX	Same as 8.16.57	Same as 8.16.57	Same as 8.16.57
8.16.61 4DL FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz	During T1: 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz

	$\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB During T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB	0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2, T3: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	$\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: -infinity E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB During T2, T3: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $\hat{E}s_1$ / N_{oc1}: 17dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 17dB E-UTRA Cell 3 N_{oc3}: -104dBm/15kHz $\hat{E}s_3$ / N_{oc3}: 17dB E-UTRA Cell 4 N_{oc4}: -104dBm/15kHz $\hat{E}s_4$ / N_{oc4}: 17dB
8.16.62 4DL TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61
8.16.63 4DL PCell in FDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61
8.16.64 4DL PCell in TDD CA Activation and Deactivation of Unknown SCell in Non-DRX	Same as 8.16.61	Same as 8.16.61	Same as 8.16.61
8.20.1 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 7dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.7dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: -infinity E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -98dBm/15kHz Ês / Noc: 7.7dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: 4dB
8.20.2 UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Same as 8.20.1	Same as 8.20.1	Same as 8.20.1
8.20.2A UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading	Same as 8.20.1	Same as 8.20.1	Same as 8.20.1

propagation conditions in synchronous cells for 20 MHz +20 MHz bandwidth			
8.20.2B UE Measurement Procedures / RAT Measurements in CA mode / E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth	Same as 8.20.1	Same as 8.20.1	Same as 8.20.1
8.20.3 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB
8.20.4 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: 5.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: -infinity PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +9.00dB E-UTRA Cell 3 Noc: -98dBm/15kHz Ês / Noc: +9.00dB UTRA Cell 2 I_{oc}: -80dBm/1.28MHz I_{or} / I_{oc}: 5.00dB PCCPCH_E_c/I_{or}: -3dB DwPCH_Ec/Ior: 0dB
8.20.4A E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	Same as 8.20.4	Same as 8.20.4	Same as 8.20.4
8.20.4B E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth	Same as 8.20.4	Same as 8.20.4	Same as 8.20.4
8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1

reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal			
8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4.00dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.00dB
8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	Same as 8.22.3	Same as 8.22.3	Same as 8.22.3
8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +4.00dB $Ês_2$ / N_{oc}: -infinity CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +4.00dB $Ês_2$ / N_{oc}: +4.00dB CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: +10.00dB	During T1: 0dB 2.10dB 0dB 0dB 0dB During T2: 0dB 2.10dB 2.10dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +6.10dB $Ês_2$ / N_{oc}: -infinity CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +6.10dB $Ês_2$ / N_{oc}: +6.10dB CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: +10.00dB
8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +4.00dB $Ês_2$ / N_{oc}: -infinity CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +4.00dB $Ês_2$ / N_{oc}: +4.00dB CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: +10.00dB	During T1: 0dB 2.60dB 0dB 0dB 0dB During T2: 0dB 2.60dB 2.60dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +6.60dB $Ês_2$ / N_{oc}: -infinity CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +6.60dB $Ês_2$ / N_{oc}: +6.60dB CSI-RS $Ês_1$ / N_{oc}: +10.00dB CSI-RS $Ês_2$ / N_{oc}: +10.00dB
8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1	Same as 8.16.1
8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	Same as 8.16.1	Same as 8.16.1	Same as 8.16.1
8.23.1 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in synchronous DC	During T1: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 16dB E-UTRA Cell 2	During T1: 0dB 0.2dB	During T1: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 16.2dB E-UTRA Cell 2

	Noc: -104dBm/15kHz Ês / Noc: 16dB During T2: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: -2.5dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 2.5dB During T3: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 20dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 20dB	0dB 0.2dB During T2: 0dB -0.2dB 0dB -0.2dB During T3: 0dB 0.2dB 0dB 0.2dB	Noc: -104dBm/15kHz Ês / Noc: 16.2dB During T2: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: -2.7dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: -2.7dB During T3: E-UTRA Cell 1 Noc: -104dBm/15kHz Ês / Noc: 20.2dB E-UTRA Cell 2 Noc: -104dBm/15kHz Ês / Noc: 20.2dB
8.23.2 E-UTRAN FDD-FDD DC intra-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.1	Same as 8.23.1	Same as 8.23.1
8.23.3 E-UTRAN TDD-TDD DC intra-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.1	Same as 8.23.1	Same as 8.23.1
8.23.4 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in synchronous DC	During T1: E-UTRA Cell 1 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: 7dB	During T1: 0dB 0dB 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: -infinity During T2: E-UTRA Cell 1 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 2 Noc: -101dBm/15kHz Ês / Noc: 4dB E-UTRA Cell 3 Noc: -101dBm/15kHz Ês / Noc: 7dB
8.23.5 E-UTRAN FDD-FDD DC inter-frequency event triggered reporting with DRX in asynchronous DC	Same as 8.23.4	Same as 8.23.4	Same as 8.23.4
8.23.6 E-UTRAN TDD-TDD DC inter-frequency event triggered reporting with DRX in synchronous DC	Same as 8.23.4	Same as 8.23.4	Same as 8.23.4
8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $Ês_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $Ês_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $Ês_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz	During T1: 0dB 0dB 0dB 0dB 0dB During T2: 0dB	During T1: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz $Ês_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $Ês_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $Ês_3$ / N_{oc2}: -infinity During T2: E-UTRA Cell 1 N_{oc1}: -104dBm/15kHz

	$\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 4dB	0dB 0dB 0dB 0dB	$\hat{E}s_1$ / N_{oc1}: 4dB E-UTRA Cell 2 N_{oc2}: -104dBm/15kHz $\hat{E}s_2$ / N_{oc2}: 4dB E-UTRA Cell 3 $\hat{E}s_3$ / N_{oc2}: 4dB
8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX for CRS based discovery signal under Operation with Frame Structure 3	Same as 8.26.5	Same as 8.26.5	Same as 8.26.5
8.26.9 E-UTRAN FDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	TBD	TBD	TBD
8.26.10 E-UTRAN TDD-FS3 inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	TBD	TBD	TBD
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported RSRP values: ±6dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_29 to RSRP_43 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_45 to RSRP_64 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_17 to RSRP_32 RSRP_18 to RSRP_33 RSRP_19 to RSRP_34 RSRP_20 to RSRP_35 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.1.1_1 FDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±4.5dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported RSRP values: ±4.5dB	Test 1: -1.0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_29 to RSRP_42 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_45 to RSRP_64 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_18 to RSRP_30 RSRP_19 to RSRP_31 RSRP_20 to RSRP_32

			RSRP_21 to RSRP_33 RSRP_22 to RSRP_34 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.1.2 FDD Intra Frequency Relative RSRP Accuracy	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported relative RSRP values: ±3dB	Test 1: 0 dB 0 dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -106 dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: 0dB RSRP_x-8 to RSRP_x+2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Same as 9.1.1.1	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.1_1 TDD Intra Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Same as 9.1.1.1_1	Same as 9.1.1.1_1	Same as 9.1.1.1_1
9.1.2.2 TDD Intra Frequency Relative RSRP Accuracy	Same as 9.1.1.2	Same as 9.1.1.2	Same as 9.1.1.2
9.1.3.1 FDD Inter Frequency Absolute RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -88.65dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB Reported RSRP values: ±8dB Test 2: N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1 / N_{oc1}$: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2 / N_{oc2}$: -4.00dB Reported RSRP values: ±6dB	Test 1: -0.6dB 0dB -0.6dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -89.25dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB RSRP_52 to RSRP_71 Test 2: N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1 / N_{oc1}$: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band $\hat{E}s_2 / N_{oc}$: -3.20dB RSRP_13 to RSRP_28 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_16 to RSRP_31 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.3.1_1 FDD Inter Frequency Absolute RSRP Accuracy (Rel 12 and forward)	Test 1: N_{oc1}: -88.65dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -88.65dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB	Test 1: -0.6dB 0dB -0.6dB 0dB	Test 1: N_{oc1}: -89.25dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -89.25dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB

	Reported RSRP values: ±8dB Test 2: N_{oc1}: (N_{oc2} +8dB) Ês1 / N_{oc1}: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band Ês2 / N_{oc2}: -4.00dB Reported RSRP values: ±6dB	Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	RSRP_52 to RSRP_71 Test 2: N_{oc1}: (N_{oc2} +8dB) Ês1 / N_{oc1}: +13.00dB N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band Ês2 / N_{oc}: -3.20dB Normal condition: RSRP_14 to RSRP_26 RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29 RSRP_18 to RSRP_30 Extreme condition: RSRP_10 to RSRP_31 RSRP_11 to RSRP_32 RSRP_12 to RSRP_33 RSRP_13 to RSRP_34 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and Ês2 / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.3.2 FDD Inter Frequency Relative RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz Ês1 / N_{oc1}: +10dB Ês2 / N_{oc2}: +10dB Reported relative RSRP values: ±6dB Test 2: N_{oc1}: (N_{oc2} +8dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band Ês1 / N_{oc1}: +13dB Ês2 / N_{oc2}: -4.0dB Reported relative RSRP values: ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz Ês1 / N_{oc}: +10dB Ês2 / N_{oc}: +10dB RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: (N_{oc2} +7dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band Ês1 / N_{oc1}: +13dB Ês2 / N_{oc2}: -3.2dB RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and Ês1 / N_{oc1} and N_{oc2} and Ês2 / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.3.2_1 FDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz Ês1 / N_{oc1}: +10dB Ês2 / N_{oc2}: +10dB Reported relative RSRP values normal: ±4.5dB Reported relative RSRP values extreme : ±6dB Test 2: N_{oc1}: (N_{oc2} +8dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band Ês1 / N_{oc1}: +13dB Ês2 / N_{oc2}: -4.0dB Reported relative RSRP values normal: ±4.5dB Reported relative RSRP values extreme : ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz Ês1 / N_{oc}: +10dB Ês2 / N_{oc}: +10dB Normal condition: RSRP_(x-7) to RSRP_(x+7) Extreme condition: RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: (N_{oc2} +7dB) N_{oc2}: -117dBm to -113.5dBm /15kHz depending on operating band Ês1 / N_{oc1}: +13dB Ês2 / N_{oc2}: -3.2dB Normal condition: RSRP_(x-30) to RSRP_(x-17) Extreme condition: RSRP_(x-32) to RSRP_(x-16)

	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $Ês_1$ / N_{oc1} and N_{oc2} and $Ês_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.4.1 TDD Inter Frequency Absolute RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.1_1 TDD Inter Frequency Absolute RSRP Accuracy (R12 and forward)	Same as 9.1.3.1	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2 TDD Inter Frequency Relative RSRP Accuracy	Same as 9.1.3.2	Same as 9.1.3.2	Same as 9.1.3.2
9.1.4.2_1 TDD Inter Frequency Relative RSRP Accuracy (Rel 12 and forward)	Same as 9.1.3.2	Same as 9.1.3.2	Same as 9.1.3.2
9.1.5.1 FDD-TDD inter frequency absolute RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $Ês_1$ / N_{oc1}: +10dB $Ês_2$ / N_{oc2}: +10dB Reported absolute RSRP values: ±8dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz $Ês_1$ / N_{oc1}: +13dB $Ês_2$ / N_{oc2}: -4.0dB Reported absolute RSRP values: ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $Ês_1$ / N_{oc}: +10dB $Ês_2$ / N_{oc}: +10dB RSRP_52 to RSRP_71 Test 2: N_{oc1}: -104Bm /15kHz N_{oc2}: -112dBm /15kHz $Ês_1$ / N_{oc1}: +13dB $Ês_2$ / N_{oc2}: -3.2dB RSRP_18 to RSRP_33
9.1.5.2 FDD-TDD Inter Frequency Relative RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $Ês_1$ / N_{oc1}: +10dB $Ês_2$ / N_{oc2}: +10dB Reported absolute RSRP values: ±6dB Test 2: N_{oc1}: -104dBm /15kHz N_{oc2}: -112dBm/15kHz $Ês_1$ / N_{oc1}: +13dB $Ês_2$ / N_{oc2}: -4.0dB Reported absolute RSRP values: ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -89.25dBm/15kHz N_{oc2}: -89.25dBm/15kHz $Ês_1$ / N_{oc}: +10dB $Ês_2$ / N_{oc}: +10dB RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: -105.0Bm /15kHz N_{oc2}: -112dBm /15kHz $Ês_1$ / N_{oc1}: +13dB $Ês_2$ / N_{oc2}: -3.2dB RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $Ês_1$ / N_{oc1} and N_{oc2} and $Ês_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.6.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: +3dB $Ês_3$ / N_{o2c}: -1dB Reported RSRP values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: +3dB $Ês_3$ / N_{o2c}: -1dB Cell 1: RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_13 to RSRP_29 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31

			depending on operating band Cell 2: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_21 to RSRP_37 RSRP_22 to RSRP_37 RSRP_23 to RSRP_38 RSRP_23 to RSRP_39 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.6.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -1dB Reported RSRP values: 4.5dB for normal conditions and 9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -1dB Normal condition Cell 1: RSRP_13 to RSRP_26 RSRP_14 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_27 RSRP_15 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 depending on operating band Cell 2: RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_35 RSRP_23 to RSRP_36 RSRP_24 to RSRP_37 RSRP_25 to RSRP_37 depending on Cell 1 band Exreme condition Cell 1: RSRP_9 to RSRP_30 RSRP_9 to RSRP_31 RSRP_10 to RSRP_31 RSRP_10 to RSRP_31 RSRP_11 to RSRP_32 RSRP_12 to RSRP_33 RSRP_12 to RSRP_34 depending on operating band Cell 2: RSRP_17 to RSRP_38 RSRP_17 to RSRP_39 RSRP_18 to RSRP_39 RSRP_18 to RSRP_40 RSRP_19 to RSRP_40 RSRP_20 to RSRP_41 RSRP_20 to RSRP_42 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from Noc1 and Es1 / Noc1, the uncertainty in Cell 2 RSRP from Noc2 and Es2 / Noc2, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.6.2 FDD Relative RSRP Accuracy for E-UTRA Carrier	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -	0dB	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -

Aggregation	113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	 0dB 0dB 0dB +0.8dB Via mapping Via mapping	114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.6.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation (Rel 12 and forward)	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -1dB Reported relative RSRP values: (Cell 2 - Cell 1): ±4.5dB for normal conditions and ±6dB for extreme conditions (Cell 3 - Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	Noc1: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band Noc2: = Noc1 +1dB Es1 / Noc1: -4dB Es2 / No2c: +3dB Es3 / No2c: -0.2dB Normal condition: (Cell 2 - Cell 1): RSRP_(x+2) to RSRP_(x+15) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1) Extreme condition: (Cell 2 - Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
9.1.7.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.7.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation	Same as 9.1.6.2	Same as 9.1.6.2	Same as 9.1.6.2
9.1.8.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB RSRP_25 to RSRP_40 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_40 to RSRP_59 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_16 to RSRP_31 RSRP_17 to RSRP_32 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc}		

	and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.8.2 FDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported relative RSRP values: ±2dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB	Test 1: 0dB 0dB +0.8dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -1.2dB RSRP_x-10 to RSRP_x-4 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_x-13 to RSRP_x-4 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_x-13 to RSRP_x-4
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For Test 1 extreme conditions allow 1dB wider at each end. Test 2, Test 3 RSRP values for extreme conditions are the same for normal conditions.		
9.1.9.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.1	Same as 9.1.8.1	Same as 9.1.8.1
9.1.9.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Same as 9.1.8.2	Same as 9.1.8.2	Same as 9.1.8.2
9.1.10.1 FDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	Test 1: 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB +0.95dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -106.0Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB RSRP_25 to RSRP_40 Test 2: N_{oc}: -88.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_40 to RSRP_59 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_16 to RSRP_31 RSRP_17 to RSRP_32 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.10.2 FDD Relative RSRP Accuracy under Time Domain	Test 1: N_{oc}: -106.0dBm/15kHz	Test 1: 0dB	Test 1: N_{oc}: -106.0Bm/15kHz

Measurement Resource Restriction with MBSFN ABS	$\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -2.0dB Reported relative RSRP values: ±2dB <u>Test 2:</u> N_{oc}: -88.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported relative RSRP values: ±3dB <u>Test 3:</u> N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported relative RSRP values: ±3dB	0dB +0.8dB Via mapping <u>Test 2:</u> 0dB 0dB +0.95dB Via mapping <u>Test 3:</u> 0dB 0dB +0.95dB Via mapping	$\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -1.2dB RSRP_x-10 to RSRP_x-4 <u>Test 2:</u> N_{oc}: -88.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRP_x-13 to RSRP_x-4 <u>Test 3:</u> N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +5.0dB $\hat{E}s_2 / N_{oc}$: -3.05dB RSRP_x-13 to RSRP_x-4
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For Test 1 extreme conditions allow 1dB wider at each end. Test 2, Test 3 RSRP values for extreme conditions are the same for normal conditions.		
9.1.11.1 TDD Absolute RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.10.1	Same as 9.1.10.1	Same as 9.1.10.1
9.1.11.2 TDD Relative RSRP Accuracy under Time Domain Measurement Resource Restriction with MBSFN ABS	Same as 9.1.10.2	Same as 9.1.10.2	Same as 9.1.10.2
9.1.12.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.12.1_1 Measurement Performance Requirements / FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.6.1_1	Same as 9.1.6.1_1	Same as 9.1.6.1_1
9.1.12.2 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.2	Same as 9.1.6.2	Same as 9.1.6.2
9.1.12.2_1 FDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz (Rel 12 and forward)	Same as 9.1.6.2_1	Same as 9.1.6.2_1	Same as 9.1.6.2_1
9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.1.6.2	Same as 9.1.6.2	Same as 9.1.6.2
9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	<u>Test 1:</u> N_{oc}: -106dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB $\hat{E}s_3 / N_{oc}$: -1.5dB Reported RSRP values: ±6dB <u>Test 2:</u> N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB $\hat{E}s_3 / N_{oc}$: -4.0dB Reported RSRP values: ±8dB	<u>Test 1:</u> 0dB 0dB 0dB 0dB Via mapping <u>Test 2:</u> 0dB 0dB 0dB +1.0dB Via mapping	<u>Test 1:</u> N_{oc}: -106.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB $\hat{E}s_3 / N_{oc}$: -1.5dB RSRP_25 to RSRP_41 <u>Test 2:</u> N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB $\hat{E}s_3 / N_{oc}$: -3.0dB RSRP_40 to RSRP_59

	Test 3: N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported RSRP values: ±6dB	Test 3: 0dB 0dB 0dB +1.0dB Via mapping	Test 3: N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31 RSRP_16 to RSRP_31 RSRP_17 to RSRP_32 RSRP_17 to RSRP_33 depending on operating band
9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -1.5dB Reported relative RSRP values: ±2dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116 to -112.5 dBm/15kHz depending on frequency band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: -3.0dB $\hat{E}s_3$ / N_{oc}: -4.0dB Reported relative RSRP values: ±3dB	Test 1: 0dB 0dB 0dB +1dB Via mapping Test 2: 0dB 0dB 0dB +1dB Via mapping Test 3: 0dB 0dB 0dB +1dB Via mapping	Test 1: N_{oc}: -106.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -0.5dB RSRP_x-8 to RSRP_x-2 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_x-12 to RSRP_x-3 Test 3: N_{oc}: -116 to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +4.0dB $\hat{E}s_2$ / N_{oc}: -3.0dB $\hat{E}s_3$ / N_{oc}: -3.0dB RSRP_x-12 to RSRP_x-3
9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.1	Same as 9.1.14.1	Same as 9.1.14.1
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2$ / N_{oc}, the uncertainty in Cell 3 RSRP from N_{oc} and $\hat{E}s_3$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For extreme conditions, the RSRP values are 3dB wider at each end in all cases.		
9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under Time-Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Same as 9.1.14.2	Same as 9.1.14.2	Same as 9.1.14.2
	The derivation of the RSRP values takes into account the uncertainty in Cell 3 RSRP from N_{oc} and $\hat{E}s_3$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. For extreme conditions, the RSRP values are 1dB wider at each end for Test 1, the same than for normal conditions for Test 2, Test 3.		
9.1.16.1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	Test 1: N_{oc}: -103dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported relative RSRP values: ±3dB Test 2:	Test 1: -1.0dB 0 dB +1.0dB Via mapping	Test 1: N_{oc}: -104.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_31 to RSRP_46

	N_{oc}: -83dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -109.5dBm/15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported relative RSRP values: ±3dB	Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 2: N_{oc}: -84dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_49 to RSRP_68 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -0.2dB RSRP_23 to RSRP_38
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.16.1_1 FDD Intra Frequency Absolute RSRP Accuracy for 5MHz Bandwidth (Rel 12 and forward)	Test 1: N_{oc}: -103dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported RSRP values: ±4.5dB Test 2: N_{oc}: -83dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -109.5dBm/15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported RSRP values: ±4.5dB	Test 1: -1.0dB 0 dB +1.0dB Via mapping Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -104.0dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_32 to RSRP_45 Test 2: N_{oc}: -84dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_49 to RSRP_68 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -0.2dB RSRP_25 to RSRP_37
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. The RSRP values are recalculated for extreme conditions.		
9.1.16.2 FDD Intra Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Test 1: N_{oc}: -103dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -83dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -109.5.5dBm /15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported relative RSRP values: ±3dB	Test 1: 0 dB 0 dB +1.0dB Via mapping Test 2: -1.0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -103 dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 2: N_{oc}: -84dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 3: N_{oc}: -109.5dBm /15kHz $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: 0dB RSRP_x-8 to RSRP_x+2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.17.1 FDD Inter Frequency Absolute RSRP Accuracy for 5MHz Bandwidth	Test 1: N_{oc1}: -85.65dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -85.65dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB Reported RSRP values: ±8dB Test 2:	Test 1: -0.6dB 0dB -0.6dB 0dB Via mapping Test 2:	Test 1: N_{oc1}: -86.25dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +10.00dB N_{oc2}: -86.25dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +10.00dB RSRP_55 to RSRP_74 Test 2:

	N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -110.5dBm /15kHz $\hat{E}s_2$ / N_{oc2}: -4.00dB Reported RSRP values: ±6dB	0dB 0dB 0dB 0.8dB Via mapping	N_{oc1}: (N_{oc2} +8dB) $\hat{E}s_1$ / N_{oc1}: +13.00dB N_{oc2}: -110.5dBm /15kHz $\hat{E}s_2$ / N_{oc}: -3.20dB RSRP_19 to RSRP_34
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.17.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP for 5MHz Bandwidth	Test 1: N_{oc1}: -85.65dBm/15kHz N_{oc2}: -85.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values: ±6dB Test 2: N_{oc1}: -102.5dBm/15kHz N_{oc2}: -110.5dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -4.0dB Reported relative RSRP values: ±6dB	Test 1: -0.6dB -0.6dB 0dB 0dB Via mapping Test 2: -1.0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -86.25dBm/15kHz N_{oc2}: -86.25dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_(x-9) to RSRP_(x+9) Test 2: N_{oc1}: -103.5dBm/15kHz N_{oc2}: -100.5dBm /15kHz $\hat{E}s_1$ / N_{oc1}: +13dB $\hat{E}s_2$ / N_{oc2}: -3.2dB RSRP_(x-32) to RSRP_(x-16)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.18.1 FDD Absolute RSRP Accuracy for E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.18.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.18.2_1 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±4.5dB normal condition ±6dB normal condition (Cell 3 – Cell 2): ±3dB normal and extreme condition	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x+2) to RSRP_(x+15) RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)

	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $Ês_1 / N_{oc1}$, the uncertainty in Cell 2 RSRP from N_{oc2} and $Ês_2 / N_{oc2}$, the uncertainty in Cell 3 RSRP from $Ês_3 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.19.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.6.1	Same as 9.1.6.1	Same as 9.1.6.1
9.1.19.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 10MHz + 5MHz	Same as 9.1.18.2	Same as 9.1.18.2	Same as 9.1.18.2
9.1.19.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz + 5MHz (Rel-12 and forward)	Same as 9.1.18.2_1	Same as 9.1.18.2_1	Same as 9.1.18.2_1
9.1.20.1 FDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $Ês_1 / N_{oc1}$: -4dB $Ês_2 / N_{oc2}$: +3dB $Ês_3 / N_{oc2}$: -1dB Reported RSRP values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $Ês_1 / N_{oc1}$: -4dB $Ês_2 / N_{oc2}$: +3dB $Ês_3 / N_{oc2}$: -1dB Cell 1: RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_13 to RSRP_29 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31 depending on operating band Cell 2: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_21 to RSRP_37 RSRP_22 to RSRP_37 RSRP_23 to RSRP_38 RSRP_23 to RSRP_39 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $Ês_1 / N_{oc1}$, the uncertainty in Cell 2 RSRP from N_{oc2} and $Ês_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.20.2 FDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 5MHz + 5MHz	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $Ês_1 / N_{oc1}$: -4dB $Ês_2 / N_{oc2}$: +3dB $Ês_3 / N_{oc2}$: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $Ês_1 / N_{oc1}$: -4dB $Ês_2 / N_{oc2}$: +3dB $Ês_3 / N_{oc2}$: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $Ês_1 / N_{oc1}$, the uncertainty in Cell 2 RSRP from N_{oc2} and $Ês_2 / N_{oc2}$, the uncertainty in Cell 3 RSRP from $Ês_3 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.21.1 TDD Absolute RSRP	Same as 9.1.20.1	Same as 9.1.20.1	Same as 9.1.20.1

Accuracy for E-UTRA Carrier Aggregation for 5MHz + 5MHz bandwidth			
9.1.21.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation for 5MHz + 5MHz	Same as 9.1.20.2	Same as 9.1.20.2	Same as 9.1.20.2
9.1.22 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in FDD	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP	Same as 9.1.37 Cell 1, Cell 2 and Cell 3	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP
9.1.23 FDD-TDD RSRP Accuracy E-UTRA for Carrier Aggregation with PCell in TDD	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP	Same as 9.1.37 Cell 1, Cell 2 and Cell 3	Same as 9.1.37 Cell 1 and Cell 2 absolute RSRP; and Cell 2 –Cell 1 relative RSRP and Cell 3- Cell 2 relative RSRP
9.1.24.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Reported RSRP values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB Cell 1: RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_14 to RSRP_29 depending on operating band Cell 2: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_22 to RSRP_37 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.24.2_1 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±4.5dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x+2) to RSRP_(x+15) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 1.5 dB wider at each end for extreme conditions.		
9.1.24.1_1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz (Rel-12 and forward)	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB	0dB 0dB 0dB 0dB 0dB	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: +3dB $\hat{E}s_3$ / N_{o2c}: -1dB

	Reported RSRP values: ±4.5dB for normal conditions and ±9dB for extreme conditions	Via mapping Via mapping	Cell 1: RSRP_13 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_28 depending on operating band Cell 2: RSRP_21 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_36 depending on Cell 1 band
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. By using separate calculation for normal and extreme condition, all cases the RSRP values are 4dB wider at each end for extreme conditions.		
9.1.24.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20MHz + 10MHz	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB Reported relative RSRP values: (Cell 2 – Cell 1): ±6dB (Cell 3 – Cell 2): ±3dB	0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: -117dBm or -116dBm or -115dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB (Cell 2 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the uncertainty in Cell 3 RSRP from $\hat{E}s_3$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal and extreme conditions.		
9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported absolute RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative RSRP values: ±3dB	Test 1: -1.0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -107.0dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_29 to RSRP_42 RSRP_25 to RSRP_46 RSRP_Cell 1 - 9 to RSRP_Cell 1 + 1
	The derivation of the RSRP values takes into account the uncertainty in Cell1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.25	Same as 9.1.25	Same as 9.1.25
	Same as 9.1.25		
9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Test 1: N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: 13dB $\hat{E}s_2$ / N_{oc2}: -6dB Reported absolute RSRP values: Normal condtion: ±4.5dB	Test 1: 0dB 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: 13dB $\hat{E}s_2$ / N_{oc2}: -5.2dB Cell 2, absolute: RSRP_14 to RSRP_26 RSRP_15 to RSRP_27 RSRP_15 to RSRP_27 RSRP_16 to RSRP_28 RSRP_16 to RSRP_28 RSRP_17 to RSRP_29

	Extreme condtion: ±9dB Reported relative RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±6dB	Via mapping Via mapping	RSRP_18 to RSRP_30 depending on operating band Cell 2, absolute: RSRP_10 to RSRP_31 RSRP_10 to RSRP_31 RSRP_11 to RSRP_32 RSRP_11 to RSRP_32 RSRP_12 to RSRP_33 RSRP_13 to RSRP_34 RSRP_13 to RSRP_34 depending on operating band Relative: RSRP_(x-31) to RSRP_(x-18) RSRP_(x-33) to RSRP_(x-17)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and Ês / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	Same as 9.1.27	Same as 9.1.27	Same as 9.1.27
	Same as 9.1.27		
9.1.29 FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Test 1: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band CRS $Ês_1$ / N_{oc}: 3dB CSI-RS $Ês_1$ / N_{oc}: 9dB CRS $Ês_2$ / N_{oc}: -1dB CSI-RS $Ês_2$ / N_{oc}: 5dB Reported absolute CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative CSI-RSRP values: Normal condition: ±2dB Extreme condition: ±3dB	Test 1: 0 dB 0 dB 0 dB 0 dB +0.8 dB Via mapping	Test 1: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band CRS $Ês_1$ / N_{oc}: 3dB CSI-RS $Ês_1$ / N_{oc}: 9dB CRS $Ês_2$ / N_{oc}: -1dB CSI-RS $Ês_2$ / N_{oc}: 5.8dB CSI-RSRP_24 to CSI-RSRP_43 CSI-RSRP_20 to CSI-RSRP_47 CSI-RSRP_Cell 1 – 7 to CSI-RSRP_Cell 1 – 1 CSI-RSRP_Cell 1 – 8 to CSI-RSRP_Cell 1 + 1
	The derivation of the CSI-RSRP values takes into account the uncertainty in Cell 1 and Cell 2 CSI-RSRP from N_{oc}, CSI-RS $Ês_1$ / N_{oc} and CSI-RS $Ês_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.30 TDD intra-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	Same as 9.1.29	Same as 9.1.29	Same as 9.1.29
9.1.31 FDD-FDD inter-frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band CSI-RS $Ês_1$ / N_{oc1}: 13dB CSI-RS $Ês_2$ / N_{oc2}: 0dB Reported absolute CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB	0dB 0dB 0dB +0.8dB Via mapping Via mapping	N_{oc1}: = N_{oc2} +6dB N_{oc2}: -115dBm to -111.5dBm /15kHz depending on operating band CSI-RS $Ês_1$ / N_{oc1}: 13dB CSI-RS $Ês_2$ / N_{oc2}: 0.8dB Cell 2: CSI_RSRP_20 to CSI_RSRP_32 CSI_RSRP_21 to CSI_RSRP_33 CSI_RSRP_21 to CSI_RSRP_33 CSI_RSRP_22 to CSI_RSRP_34 CSI_RSRP_22 to CSI_RSRP_34 CSI_RSRP_23 to CSI_RSRP_35 CSI_RSRP_24 to CSI_RSRP_36 CSI_RSRP_16 to CSI_RSRP_37 CSI_RSRP_16 to CSI_RSRP_37

	Reported relative CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±6dB	Via mapping Via mapping	CSI_RSRP_17 to CSI_RSRP_38 CSI_RSRP_17 to CSI_RSRP_38 CSI_RSRP_18 to CSI_RSRP_39 CSI_RSRP_19 to CSI_RSRP_40 CSI_RSRP_19 to CSI_RSRP_40 Cell 2 – Cell 1 CSI_RSRP_Cell 1 – 25 to CSI_RSRP_Cell 1 – 12 CSI_RSRP_Cell 1 – 27 to CSI_RSRP_Cell 1 – 11
	The derivation of the CSI-RSRP values takes into account the uncertainty in Cell 1 and Cell 2 CSI-RSRP from N_{oc}, CSI-RS $\hat{E}s_1 / N_{oc}$ and CSI-RS $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Test 1: N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: 3dB $\hat{E}s_3 / N_{oc2}$: -1dB Reported absolute RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported relative RSRP values: (Cell 3 – Cell 2): ±3dB (Cell 3 – Cell 1): Normal condtion: ±4.5dB Extreme condtion: ±6dB	Test 1: 0dB 0dB 0dB 0dB +0.8dB Via mapping Via mapping Via mapping	Test 1: N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{oc2}$: 3dB $\hat{E}s_3 / N_{oc2}$: -0.2dB Cell 3, absolute: RSRP_18 to RSRP_30 RSRP_19 to RSRP_31 RSRP_19 to RSRP_31 RSRP_20 to RSRP_32 RSRP_20 to RSRP_32 RSRP_21 to RSRP_33 RSRP_22 to RSRP_34 depending on operating band Cell 3, absolute: RSRP_14 to RSRP_35 RSRP_14 to RSRP_35 RSRP_15 to RSRP_36 RSRP_15 to RSRP_36 RSRP_16 to RSRP_37 RSRP_17 to RSRP_38 RSRP_17 to RSRP_38 depending on operating band Relative: RSRP_(x-8) to RSRP_(x+1) RSRP_(x-2) to RSRP_(x+12) RSRP_(x-4) to RSRP_(x+13)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s / N_{oc}$ values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	Same as 9.1.33	Same as 9.1.33	Same as 9.1.33
	Same as 9.1.33		
9.1.35 FDD absolute and relative CSI-RSRP accuracies for E-	N_{oc1}: -117dBm to -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc2} +1dB CSI-RS $\hat{E}s_1 / N_{oc1}$: 2dB CSI-RS $\hat{E}s_2 / N_{oc2}$: 9dB		

UTRAN Carrier Aggregation in CSI-RS based discovery signal	CSI-RS $\hat{E}s_3$ / N_{oc3}: 5dB Reported absolute CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±9dB Reported intra-freq relative CSI-RSRP values: Normal condtion: ±2dB Extreme condtion: ±3dB Reported inter-freq relative CSI-RSRP values: Normal condtion: ±4.5dB Extreme condtion: ±6dB		
	The derivation of the CSI-RSRP values takes into account the uncertainty in Cell 1 and Cell 2 CSI-RSRP from N_{oc}, CSI-RS $\hat{E}s$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function.		
9.1.36 TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	Same as 9.1.35		
9.1.37 3DL PCell in FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -1dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -1dB	0dB 0dB 0dB 0dB 0dB +0.8dB 0dB +0.8dB	N_{oc1}: -117dBm or -116.5dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: +3dB $\hat{E}s_3$ / N_{oc2}: -0.2dB $\hat{E}s_4$ / N_{oc3}: +3dB $\hat{E}s_5$ / N_{oc3}: -0.2dB

	Reported absolute RSRP values: ±4.5dB for normal conditions and ±9dB for extreme conditions	Via mapping	Cell 1, absolute: RSRP_13 to RSRP_26 RSRP_14 to RSRP_26 RSRP_14 to RSRP_27 RSRP_15 to RSRP_27 RSRP_15 to RSRP_28 RSRP_16 to RSRP_29 RSRP_17 to RSRP_29 depending on operating band Cell 2 and Cell 4, absolute: RSRP_21 to RSRP_34 RSRP_22 to RSRP_34 RSRP_22 to RSRP_35 RSRP_23 to RSRP_35 RSRP_23 to RSRP_36 RSRP_24 to RSRP_37 RSRP_25 to RSRP_37 depending on Cell 1 band
	Reported relative RSRP values: (Cell 2 – Cell 1) and (Cell 4 – Cell 1): ±4.5dB for normal conditions ±6dB for extreme conditions (Cell 3 - Cell 2) and (Cell 5 - Cell 4): ±3dB	Via mapping Via mapping	Relative: (Cell 2 – Cell 1) and (Cell 4 – Cell 1): RSRP_(x+2) to RSRP_(x+15) (Cell 3 - Cell 2) and (Cell 5 - Cell 4): RSRP_(x-8) to RSRP_(x+1)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and Ês / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.38 3DL PCell in TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.37	Same as 9.1.37	Same as 9.1.37
9.1.39 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB Ês$_1$ / N_{oc1}: -4dB Ês$_2$ / N_{oc2}: +3dB Ês$_3$ / N_{oc2}: -1dB Ês$_4$ / N_{oc3}: +3dB Ês$_5$ / N_{oc3}: -1dB Reported absolute RSRP values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB 0dB 0dB +0.8dB 0dB +0.8dB Via mapping	N_{oc1}: -117dBm or -116dBm or -115.5dBm or -115 dBm or -114dBm or -113.5dBm /15kHz depending on operating band N_{oc2}: = N_{oc1} +1dB N_{oc3}: = N_{oc1} +1dB Ês$_1$ / N_{oc1}: -4dB Ês$_2$ / N_{oc2}: +3dB Ês$_3$ / N_{oc2}: -0.2dB Ês$_4$ / N_{oc3}: +3dB Ês$_5$ / N_{oc3}: -0.2dB Cell 1, absolute: RSRP_12 to RSRP_27 RSRP_13 to RSRP_28 RSRP_13 to RSRP_29 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_15 to RSRP_31 depending on operating band Cell 2 and Cell 4, absolute: RSRP_20 to RSRP_35 RSRP_21 to RSRP_36 RSRP_21 to RSRP_37 RSRP_22 to RSRP_37 RSRP_23 to RSRP_38 RSRP_23 to RSRP_39 depending on Cell 1 band
	Reported relative RSRP values: (Cell 2 – Cell 1) and (Cell 4 – Cell 1): ±6dB (Cell 3 – Cell 2) and (Cell 5 – Cell 4): ±3dB	 Via mapping Via mapping	Relative: (Cell 2 – Cell 1) and (Cell 4 – Cell 1): RSRP_(x-1) to RSRP_(x+17) (Cell 3 - Cell 2) and (Cell 5 - Cell 4): RSRP_(x-8) to RSRP_(x+1)

	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and Ês / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.39_1 3DL FDD RSRP for E-UTRAN in Carrier Aggregation (Rel-12 and forward)	Same as 9.1.37	Same as 9.1.37	Same as 9.1.37
9.1.40 3DL TDD RSRP for E-UTRAN in Carrier Aggregation	Same as 9.1.39	Same as 9.1.39	Same as 9.1.39
9.1.40_1 3DL TDD RSRP for E-UTRAN in Carrier Aggregation (Rel-12 and forward)	Same as 9.1.37	Same as 9.1.37	Same as 9.1.37
9.1.41.1 FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	<u>Test 1:</u> Noc: -106dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +1.0dB Reported RSRP values: ±7dB <u>Test 2:</u> Noc: -86dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +1.0dB Reported RSRP values: ±9dB <u>Test 3:</u> Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +3.0dB Ês2 / Noc: -1.0dB Reported RSRP values: ±7dB	<u>Test 1:</u> -1.0dB 0dB +1.0dB Via mapping <u>Test 2:</u> -1.0dBdB 0dB +1.0dB Via mapping <u>Test 3:</u> 0dB 0dB +0.8dB Via mapping	<u>Test 1:</u> Noc: -107.0dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +2.0dB RSRP_27 to RSRP_44 <u>Test 2:</u> Noc: -87dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +2.0dB RSRP_45 to RSRP_66 <u>Test 3:</u> Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +3.0dB Ês2 / Noc: -0.2dB RSRP_16 to RSRP_33 RSRP_17 to RSRP_34 RSRP_18 to RSRP_35 RSRP_19 to RSRP_36 depending on operating band
9.1.41.2 FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	<u>Test 1:</u> Noc: -106dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +1.0dB Reported relative RSRP values: ±4dB <u>Test 2:</u> Noc: -86dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +1.0dB Reported relative RSRP values: ±4dB <u>Test 3:</u> Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +3.0dB Ês2 / Noc: -1.0dB Reported relative RSRP values: ±4dB	<u>Test 1:</u> 0 dB 0 dB +1.0dB Via mapping <u>Test 2:</u> -1.0dB 0dB +1.0dB Via mapping <u>Test 3:</u> 0dB 0dB +1.0dB Via mapping	<u>Test 1:</u> Noc: -106 dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +2.0dB RSRP_x-10 to RSRP_x+2 <u>Test 2:</u> Noc: -87dBm/15kHz Ês1 / Noc: +6.0dB Ês2 / Noc: +2.0dB RSRP_x-10 to RSRP_x+2 <u>Test 3:</u> Noc: -116dBm to -112.5dBm /15kHz depending on operating band Ês1 / Noc: +3.0dB Ês2 / Noc: 0dB RSRP_x-9 to RSRP_x+3
9.1.42.1 HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	Same as 9.1.41.1	Same as 9.1.41.1	Same as 9.1.41.1
9.1.42.2 HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.41.2	Same as 9.1.41.2	Same as 9.1.41.2
9.1.43.1 TDD Intra	Same as 9.1.41.1	Same as 9.1.41.1	Same as 9.1.41.1

Frequency Absolute RSRP Accuracy for UE category 0			
9.1.43.2 TDD Intra Frequency Relative RSRP Accuracy for UE category 0	Same as 9.1.41.2	Same as 9.1.41.2	Same as 9.1.41.2
9.1.52 FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	<u>Test 1:</u> N_{oc}: -106dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported absolute RSRP values: Normal conditions: ±7dB Extreme conditions: ±10dB Reported relative RSRP values: Normal and extreme conditions: ±4dB <u>Test 2:</u> N_{oc}: -86dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +1.0dB Reported absolute RSRP values: Normal conditions: ±9dB Extreme conditions: ±12dB Reported relative RSRP values: Normal and extreme conditions: ±4dB <u>Test 3:</u> N_{oc}: -116dBm to -112.5 dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -1.0dB Reported absolute RSRP values: Normal conditions: ±7dB Extreme conditions: ±10dB Reported relative RSRP values: Normal and extreme conditions: ±4dB	<u>Test 1:</u> -1.0dB 0dB +1.0dB Via mapping <u>Test 2:</u> -1.0dB 0dB +1.0dB Via mapping <u>Test 3:</u> 0dB 0dB +0.8dB Via mapping	<u>Test 1:</u> N_{oc}: -107dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_27 to RSRP_44 RSRP_24 to RSRP_47 RSRP_Cell 1 – 10 to RSRP_Cell 1 + 2 <u>Test 2:</u> N_{oc}: -87dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.0dB $\hat{E}s_2$ / N_{oc}: +2.0dB RSRP_45 to RSRP_66 RSRP_52 to RSRP_69 RSRP_Cell 1 – 10 to RSRP_Cell 1 + 2 <u>Test 3:</u> N_{oc}: -116dBm to -112.5 dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: -0.2dB RSRP_16 to RSRP_33 RSRP_16 to RSRP_33 RSRP_17 to RSRP_34 RSRP_17 to RSRP_34 RSRP_18 to RSRP_35 RSRP_19 to RSRP_36 RSRP_19 to RSRP_36 RSRP_13 to RSRP_36 RSRP_13 to RSRP_36 RSRP_14 to RSRP_37 RSRP_14 to RSRP_37 RSRP_15 to RSRP_38 RSRP_16 to RSRP_39 RSRP_16 to RSRP_39 RSRP_Cell 1 – 9 to RSRP_Cell 1 + 2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The absolute RSRP values given above are different for normal and extreme conditions. The relative RSRP values given above are for both normal and extreme conditions.		
9.1.53 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52	Same as 9.1.52
9.1.54 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	Same as 9.1.52	Same as 9.1.52	Same as 9.1.52
9.1.57 FD-FDD RSRP Intra frequency case for Cat-M1 UE in	<u>Test 1:</u> $N_{oc:}$ = -99dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -14dB	<u>Test 1:</u> -0.3dB 0dB +0.1dB	<u>Test 1:</u> $N_{oc:}$ = -99.3dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -13.9dB

CEModeB	Reported absolute RSRP values: Normal condtion: ±8dB Extreme condtion: ±11dB Reported relative RSRP values: Normal condtion: ±5dB Extreme condtion: ±5dB Test 2: N_{oc}: = -79dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -14dB Reported absolute RSRP values: Normal condtion: ±10dB Extreme condtion: ±13dB Reported relative RSRP values: Normal condtion: ±5dB Extreme condtion: ±5dB Test 3: N_{oc}: = -107dBm~-103.5dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -14dB Reported absolute RSRP values: Normal condtion: ±8dB Extreme condtion: ±11dB Reported relative RSRP values: Normal condtion: ±5dB Extreme condtion: ±5dB	Via mapping Via mapping Test 2: -0.3dB 0dB +0.1dB Via mapping Via mapping Test 3: 0dB 0dB +0.1dB Via mapping Via mapping Via mapping	Cell 2, absolute: RSRP_18 to RSRP_37 RSRP_15 to RSRP_40 Relative: RSRP_(x-9) to RSRP_(x+5) RSRP_(x-9) to RSRP_(x+5) Test 2: N_{oc}: = -79.3dBm/15kHz $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -13.9dB Cell 2, absolute: RSRP_36 to RSRP_59 RSRP_33 to RSRP_62 Relative: RSRP_(x-9) to RSRP_(x+5) RSRP_(x-9) to RSRP_(x+5) Test 3: N_{oc}: = -107dBm~-103.5dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -12dB $\hat{E}s_2$ / N_{oc}: -13,9dB Cell 2, absolute: RSRP_10 to RSRP_29 RSRP_11 to RSRP_30 RSRP_11 to RSRP_30 RSRP_12 to RSRP_31 RSRP_12 to RSRP_31 RSRP_13 to RSRP_32 RSRP_14 to RSRP_33 depending on operating band Cell 2, absolute: RSRP_7 to RSRP_32 RSRP_8 to RSRP_33 RSRP_8 to RSRP_33 RSRP_9 to RSRP_34 RSRP_9 to RSRP_34 RSRP_10 to RSRP_35 RSRP_11 to RSRP_36 depending on operating band Relative: RSRP_(x-9) to RSRP_(x+5) RSRP_(x-9) to RSRP_(x+5)
	The derivation of the RSRP values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.1.58 HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57	Same as 9.1.57
	Same as 9.1.57		
9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	Same as 9.1.57	Same as 9.1.57	Same as 9.1.57
	Same as 9.1.57		

9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.51Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_14 Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -116dBm/15kHz $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.51Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRQ_14 Test 3: N_{oc}: -116dBm/15kHz $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 2 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.5dBm to -116dBm/15kHz	Test 1: 0dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -81.1dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -1.75dB $\hat{E}s_2$ / N_{oc2}: -1.75dB RSRQ_04 to RSRQ_16 (NTC) RSRQ_01 to RSRQ_19 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC) Test 3: N_{oc1}: -119.5dBm to-116 dBm /15kHz depending on operating band N_{oc2}: -119.2dBm -115.7dBm /15kHz

	depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	0.3dB 0dB 0.8dB Via mapping	depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.3.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.5dBm to -116dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±4dB	Test 1: -1.1dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB +0.3dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -81.1dBm/15kHz N_{oc2}: -81.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 9 to RSRQ_x + 11 Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -119.2dBm to -115.7dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 9 to RSRQ_x + 11
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$ and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy	Same as 9.2.3.1		
9.2.4.2 TDD - TDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.2		
9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4.0dB $\hat{E}s_2 / N_{o2c}$: -4.0dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Test 3: N_{oc1}: -114.5dBm/15kHz	Test 1: 0dB -1.10dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -81.10dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_04 to RSRQ_16 (NTC) RSRQ_01 to RSRQ_19 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC) Test 3: N_{oc1}: -114.5dBm/15kHz

	N_{oc2}: -114.5dBm/15kHz $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0.8dB Via mapping	N_{oc2}: -114.5dBm/15kHz $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $Ês_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $Ês_1$ / N_{oc1}: -1.75dB $Ês_2$ / N_{oc2}: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -4dB Reported Relative RSRQ values: ±4dB	Test 1: -1.10dB -1.10dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -81.10dBm/15kHz N_{oc2}: -81.10dBm/15kHz $Ês_1$ / N_{oc1}: -1.75dB $Ês_2$ / N_{oc2}: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -104.7dBm/15kHz N_{oc2}: -104.7dBm/15kHz $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -3.2dB RSRQ_x - 10 to RSRQ_x + 10 Test 3: N_{oc1}: -114.5dBm/15kHz N_{oc2}: -114.5dBm/15kHz $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -3.2dB RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $Ês_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $Ês_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.5.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -4dB $Ês_3$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -3.7dB $Ês_3$ / N_{o2c}: -4dB Cell 1: RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) Cell 2: RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $Ês_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $Ês_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.5.2 FDD Relative RSRQ Accuracy E-UTRA for Carrier Aggregation	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $Ês_1$ / N_{oc1}: -4dB	0dB 0dB 0dB	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $Ês_1$ / N_{oc1}: -4dB $Ês_2$ / N_{o2c}: -3.7dB

	$\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB Reported RSRQ values: ±4dB	+0.3dB 0dB Via mapping	$\hat{E}s_3$ / N_{o2c}: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
9.2.6.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.1	Same as 9.2.5.1	Same as 9.2.5.1
9.2.6.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation	Same as 9.2.5.2	Same as 9.2.5.2	Same as 9.2.5.2
9.2.7.1 FDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRQ values: ±2.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -1.0dB 0dB +0.8dB Via mapping Test 2: 0dB 0dB +0.8dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -85.76Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -1.2dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -1.2dB RSRQ_04 to RSRQ_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For tests 1 and 2 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.8.1 TDD RSRQ under Time Domain Measurement Resource Restriction with Non-MBSFN ABS	Subset of 9.2.7.1	Same as 9.2.7.1	Subset of 9.2.7.1
9.2.9.1 FDD Absolute RSRQ under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -2.0dB Reported RSRQ values: ±2.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -1.0dB 0dB +0.8dB Via mapping Test 2: 0dB 0dB +0.8dB Via mapping Test 3: 0dB 0dB +0.95dB Via mapping	Test 1: N_{oc}: -85.76Bm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -1.2dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -1.2dB RSRQ_04 to RSRQ_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: +5.0dB $\hat{E}s_2$ / N_{oc}: -3.05dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For tests 1 and 2 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.10.1 TDD Absolute RSRQ under Time	Subset of 9.2.9.1	Same as 9.2.9.1	Subset of 9.2.9.1

Domain Measurement Resource Restriction with MBSFN ABS (eICIC)			
9.2.11.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.1	Same as 9.2.5.1	Same as 9.2.5.1
9.2.11.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.2	Same as 9.2.5.2	Same as 9.2.5.2
9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.1	Same as 9.2.5.1	Same as 9.2.5.1
9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	Same as 9.2.5.2	Same as 9.2.5.2	Same as 9.2.5.2
9.2.15.1 FDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Test 1: N_{oc}: -84.76dBm/15kHz $Ês_1 / N_{oc}$: +4.0dB $Ês_2 / N_{oc}$: +2.0dB $Ês_3 / N_{oc}$: -1.5dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $Ês_1 / N_{oc}$: +4.0dB $Ês_2 / N_{oc}$: +2.0dB $Ês_3 / N_{oc}$: -1.5dB Reported RSRQ values: ±2.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $Ês_1 / N_{oc}$: +4.0dB $Ês_2 / N_{oc}$: +2.0dB $Ês_3 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: 0dB 0dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -84.76Bm/15kHz $Ês_1 / N_{oc}$: +4.0dB $Ês_2 / N_{oc}$: +2.0dB $Ês_3 / N_{oc}$: -0.5dB RSRQ_05 to RSRQ_17 Test 2: N_{oc}: -103.85dBm/15kHz $Ês_1 / N_{oc}$: +4.0dB $Ês_2 / N_{oc}$: +2.0dB $Ês_3 / N_{oc}$: -0.5dB RSRQ_05 to RSRQ_17 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $Ês_1 / N_{oc}$: +4.0dB $Ês_2 / N_{oc}$: +2.0dB $Ês_3 / N_{oc}$: -3.0dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 3 RSRQ from $Ês_1 / N_{oc}$, $Ês_2 / N_{oc}$, and $Ês_3 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For tests 1 and 2 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.16.1 TDD RSRQ Accuracy under Time Domain Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	Subset of 9.2.15.1	Same as 9.2.15.1	Subset of 9.2.15.1
9.2.17.1 FDD Intra Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	Test 1: N_{oc}: -81.76dBm/15kHz $Ês_1 / N_{oc}$: +3.0dB $Ês_2 / N_{oc}$: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -100.85dBm/15kHz $Ês_1 / N_{oc}$: -2.9dB $Ês_2 / N_{oc}$: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -109.5dBm /15kHz $Ês_1 / N_{oc}$: -4.0dB	Test 1: -1.05dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB	Test 1: N_{oc}: -82.81Bm/15kHz $Ês_1 / N_{oc}$: +3.0dB $Ês_2 / N_{oc}$: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -100.85dBm/15kHz $Ês_1 / N_{oc}$: -2.9dB $Ês_2 / N_{oc}$: -2.9dB RSRQ_00 to RSRP_14 Test 3: N_{oc}: -109.5dBm /15kHz $Ês_1 / N_{oc}$: -3.6dB

	$\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	+0.4dB Via mapping	$\hat{E}s_2 / N_{oc}$: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.18.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth	Test 1: N_{oc1}: -77dBm/15kHz N_{oc2}: -77dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: 113dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	Test 1: 0dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB 0.3dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -77dBm/15kHz N_{oc2}: -78.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_04 to RSRQ_16 (NTC) RSRQ_01 to RSRQ_19 (ETC) Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC) Test 3: N_{oc1}: -119.5dBm to -116dBm /15kHz depending on operating band N_{oc2}: -112.7dBm /15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_00 to RSRQ_16 (NTC) RSRQ_00 to RSRQ_17 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.18.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy for 5MHz Bandwidth	Test 1: N_{oc1}: -77dBm/15kHz N_{oc2}: -77dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: 113dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB Reported Relative RSRQ values: ±4dB	Test 1: -1.1dB -1.1dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0.8dB Via mapping Test 3: 0dB +0.3dB 0dB 0.8dB Via mapping	Test 1: N_{oc1}: -78.1dBm/15kHz N_{oc2}: -78.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -101.7dBm/15kHz N_{oc2}: -101.7dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 9 to RSRQ_x + 11 Test 3: N_{oc1}: -119.5dBm to -116dBm/15kHz depending on operating band N_{oc2}: -112.7dBm /15kHz $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.2dB RSRQ_x - 9 to RSRQ_x + 11
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$ and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.19.1 FDD-FDD Inter	FFS	FFS	FFS

Frequency absolute WB-RSRQ accuracy			
9.2.20.1 TDD-TDD Inter Frequency absolute WB-RSRQ accuracy	FFS	FFS	FFS
9.2.21.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB <u>Reported RSRQ values:</u> ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB <u>Cell 1:</u> RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) <u>Cell 2:</u> RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.21.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB <u>Reported RSRQ values:</u> ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.22.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.1	Same as 9.2.21.1	Same as 9.2.21.1
9.2.22.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	Same as 9.2.21.2	Same as 9.2.21.2	Same as 9.2.21.2
9.2.23.1 FDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: -4dB $\hat{E}s_3$ / N_{oc2}: -4dB <u>Reported RSRQ values:</u> ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: -3.7dB $\hat{E}s_3$ / N_{oc2}: -4dB <u>Cell 1:</u> RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) <u>Cell 2:</u> RSRQ_00 to RSRQ_14 (NTC)

			RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.23.2 FDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: -4dB $\hat{E}s_3$ / N_{oc2}: -4dB Reported RSRQ values: ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -118dBm or -117.5 dBm or -116.5dBm or -116dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114.5dBm or -114 dBm or -113dBm or -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{oc2}: -3.7dB $\hat{E}s_3$ / N_{oc2}: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
9.2.24.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.1	Same as 9.2.23.1	Same as 9.2.23.1
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1}, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.24.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 5MHz+5MHz	Same as 9.2.23.2	Same as 9.2.23.2	Same as 9.2.23.2
9.2.25.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part	Same as 9.2.38 Cell 1 and Cell 2	Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part
9.2.25.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in FDD	Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part	Same as 9.2.38 Cell 1 and Cell 2	Same as 9.2.38 Cell 1 and Cell 2, absolute RSRQ part
9.2.26.1 Absolute RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part	Same as 9.2.39 Cell 1 and Cell 2	Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part
9.2.26.2 Relative RSRQ Accuracy for E-UTRAN TDD-FDD Carrier Aggregation with PCell in TDD	Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part	Same as 9.2.39 Cell 1 and Cell 2	Same as 9.2.39 Cell 1 and Cell 2, absolute RSRQ part
9.2.27.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -4dB $\hat{E}s_3$ / N_{o2c}: -4dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	0dB 0dB 0dB +0.3dB 0dB Via mapping Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -4dB $\hat{E}s_2$ / N_{o2c}: -3.7dB $\hat{E}s_3$ / N_{o2c}: -4dB Cell 1: RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC) Cell 2: RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and		

	$\hat{E}s_1 / N_{oc1}$, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.27.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz+10MHz	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -4dB $\hat{E}s_3 / N_{o2c}$: -4dB Reported RSRQ values: ±4dB	0dB 0dB 0dB +0.3dB 0dB Via mapping	N_{oc1}: -119.5dBm or -118.5dBm or -117.5 dBm /15kHz depending on operating band N_{oc2}: -116dBm or -115dBm or -114 dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4dB $\hat{E}s_2 / N_{o2c}$: -3.7dB $\hat{E}s_3 / N_{o2c}$: -4dB RSRQ_x - 12 to RSRQ_x + 9 (NTC and ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$, the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Test 1: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: -4.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: -3.6dB $\hat{E}s_2 / N_{oc}$: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	Test 1: N_{oc}: -116dBm to -114dBm /15kHz $\hat{E}s_1 / N_{oc}$: -4.0dB $\hat{E}s_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -116dBm to -114dBm /15kHz $\hat{E}s_1 / N_{oc}$: -3.6dB $\hat{E}s_2 / N_{oc}$: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.38 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	N_{oc1}: -119.5dBm to -116dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -6dB $\hat{E}s_2 / N_{oc2}$: -6dB $\hat{E}s_3 / N_{oc3}$: -6dB Reported absolute RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Reported relative RSRQ values: (Cell 2 – Cell 1) and (Cell 3 – Cell 1): ±4dB for normal conditions ±4dB for extreme conditions	0.3dB 0dB 0dB +0.8dB +0.8dB +0.8dB Via mapping Via mapping	N_{oc1}: -119.2dBm to -115.7dBm /15kHz depending on operating band N_{oc2}: -116dBm to -114dBm /15kHz depending on operating band N_{oc3}: -116dBm to -114dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -5.20dB $\hat{E}s_2 / N_{oc2}$: -5.20dB $\hat{E}s_3 / N_{oc3}$: -5.20dB Absolute: Cell 1, Cell 2, and Cell 3 RSRQ_0 to RSRQ_14 Relative: (Cell 2 – Cell 1) and (Cell 3 – Cell 1): RSRQ_(x-10) to RSRQ_(x+10)
	The derivation of the RSRQ values takes into account the uncertainty from all applicable N_{oc} and $\hat{E}s$ / N_{oc} values, the allowed UE reporting accuracy, and the UE mapping function. Where extreme condition UE accuracies differ from normal condition accuracies, reported values are recalculated.		
9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Test 1: N_{oc1}: -117.5dBm to -114dBm/15kHz depending on operating band N_{oc2}: -117.5dBm to -114dBm/15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -6dB $\hat{E}s_2 / N_{o2c}$: -6dB	Test 1: 0dB 0.3dB 0.8dB 0.8dB	Test 1: N_{oc1}: -117.5dBm to-114 dBm /15kHz depending on operating band N_{oc2}: -117.2dBm -113.7dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -5.2dB $\hat{E}s_2 / N_{o2c}$: -5.2dB

	Reported absolute RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Reported absolute RSRQ values: ±4dB for both normal conditions and extreme conditions	Via mapping	 RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC) RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the absolute RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	Test 1: N_{oc1}: -117.5dBm to -115.5dBm/15kHz depending on operating band N_{oc2}: -117.5dBm to -115.5dBm/15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -6dB $\hat{E}s_2$ / N_{o2c}: -6dB Reported absolute RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Reported absolute RSRQ values: ±4dB for both normal conditions and extreme conditions	Test 1: 0dB 0.3dB 0.8dB 0.8dB Via mapping	Test 1: N_{oc1}: -117.5dBm to-115.5 dBm /15kHz depending on operating band N_{oc2}: -117.2dBm -115.2dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: -5.2dB $\hat{E}s_2$ / N_{o2c}: -5.2dB RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC) RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the absolute RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.39 3DL PCell in TDD RSRQ for E-UTRAN in Carrier Aggregation	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38
9.2.40 3DL FDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38
9.2.41 3DL TDD RSRQ for E-UTRA Carrier Aggregation	Same as 9.2.38	Same as 9.2.38	Same as 9.2.38
9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Test 1: N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±3.5dB Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±4.5dB Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±4.5dB	Test 1: -1.05dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.81Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_02 to RSRQ_18 Test 2: N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_16 Test 3: N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	Same as 9.2.42.1	Same as 9.2.42.1	Same as 9.2.42.1
9.2.44.1 TDD Intra	Test 1:	Test 1:	Test 1:

Frequency Absolute RSRQ Accuracy for UE category 0	N_{oc}: -84.76dBm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB Reported RSRQ values: ±3.5dB <u>Test 2:</u> N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB Reported RSRQ values: ±4.5dB <u>Test 3:</u> N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -4.0dB $\hat{E}s_2$ / N_{oc}: -4.0dB Reported RSRQ values: ±4.5dB	-1.05dB 0dB 0dB Via mapping <u>Test 2:</u> 0dB 0dB 0dB Via mapping <u>Test 3:</u> 0dB +0.4dB +0.4dB Via mapping	N_{oc}: -85.81Bm/15kHz $\hat{E}s_1$ / N_{oc}: +3.0dB $\hat{E}s_2$ / N_{oc}: +3.0dB RSRQ_02 to RSRQ_18 <u>Test 2:</u> N_{oc}: -103.85dBm/15kHz $\hat{E}s_1$ / N_{oc}: -2.9dB $\hat{E}s_2$ / N_{oc}: -2.9dB RSRQ_00 to RSRP_16 <u>Test 3:</u> N_{oc}: -116dBm to -112.5dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc}: -3.6dB $\hat{E}s_2$ / N_{oc}: -3.6dB RSRQ_00 to RSRQ_16
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $\hat{E}s_2$ / N_{oc}, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 2 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	<u>Test 1:</u> E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -60.00dBm/3.84MHz Ior / Ioc: +9.54dB CPICH_Ec/Ior: -10.00dB Reported CPICH_RSCP values: ±8dB <u>Test 2:</u> E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -94.46dBm or -92.46dBm or -90.96dBm or -91.46dBm or -93.46dBm /3.84MHz depending on operating band Ior / Ioc: -9.54dB CPICH_Ec/Ior: -10.00dB Reported CPICH_RSCP values: ±6dB	<u>Test 1:</u> 0dB 0dB -0.75dB 0dB 0dB Via mapping <u>Test 2:</u> 0dB 0dB 0.7dB 0.35dB 0dB Via mapping	<u>Test 1:</u> E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -60.75dBm/3.84MHz Ior / Ioc: +9.54dB CPICH_Ec/Ior: -10.00dB CPICH_RSCP_46 to CPICH_RSCP_63 <u>Test 2:</u> E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -93.76dBm or -91.76dBm or -90.26dBm or -90.76dBm or -92.76dBm /3.84MHz depending on operating band Ior / Ioc: -9.19dB CPICH_Ec/Ior: -10.00dB CPICH_RSCP_-04 to CPICH_RSCP_9 CPICH_RSCP_-02 to CPICH_RSCP_11 CPICH_RSCP_-01 to CPICH_RSCP_12 CPICH_RSCP_-03 to CPICH_RSCP_10 depending on operating band
	The derivation of the CPICH_RSCP values takes into account the uncertainty in Cell 2 CPICH_RSCP from Ioc, Ior / Ioc and CPICH_Ec/Ior, the allowed UE reporting accuracy, and the UE mapping function. The CPICH_RSCP values given above are for normal conditions. In all cases the CPICH_RSCP values are 3dB wider at each end for extreme conditions.		
9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy	Same as 9.3.1	Same as 9.3.1	Same as 9.3.1
9.3.3 E UTRAN FDD UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	Same as 9.3.1	Same as 9.3.1	Same as 9.3.1
9.4.1 E-UTRAN FDD – UTRA FDD CPICH Ec/No absolute accuracy	<u>Test 1:</u> E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -52.22dBm/3.84MHz Ior / Ioc: -1.75dB CPICH_Ec/Ior: -10.00dB	<u>Test 1:</u> 0dB -0dB -0.9dB 0.3dB 0dB	<u>Test 1:</u> E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -53.12dBm/3.84MHz Ior / Ioc: -1.45dB CPICH_Ec/Ior: -10.00dB

	Reported CPICH_Ec/Io accuracy values: ±1.5dB for normal conditions and ±3dB for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -87.27dBm/3.84MHz Ior / Ioc: -4.7dB CPICH_Ec/Ior: -10.00dB Reported CPICH_Ec/Io accuracy values: ±2dB for normal conditions and ±3dB for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -94.46dBm or -92.46dBm or 90.96dBm or -91.46dBm or -93.46dBm/3.84MHz depending on operating band Ior / Ioc: -9.54dB CPICH_Ec/Ior: -10.00dB Reported CPICH_Ec/Io accuracy values: -4.2 to +3dB for normal conditions and extreme conditions. The additional 1.2 dB relaxation to the lower limit for both normal and extreme condition is to take into account the effect of thermal noise and noise generated in the receiver as specified in A.9.4.1.3 of TS 36.133 [4]	Via mapping Test 2: 0dB 0dB 0dB 0.3dB 0dB Via mapping Test 3: 0dB 0dB 0.7dB 0.4dB 0dB Via mapping	CPICH_Ec/Io_17 to CPICH_Ec/Io_24 for normal conditions. CPICH_Ec/Io_14 to CPICH_Ec/Io_27 for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -87.27dBm/3.84MHz Ior / Ioc: -4.4dB CPICH_Ec/Ior: -10.00dB CPICH_Ec/Io_13 to CPICH_Ec/Io_22 for normal conditions. CPICH_Ec/Io_11 to CPICH_Ec/Io_24 for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -93.76dBm or -91.76dBm or 90.26dBm or -90.76dBm or -92.76dBm /3.84MHz depending on operating band Ior / Ioc: -9.14dB CPICH_Ec/Ior: -10.00dB CPICH_Ec/Io_0 to CPICH_Ec/Io_16 for normal and extreme conditions.
9.4.2 E-UTRAN TDD – UTRA FDD CPICH Ec/No absolute accuracy	Same as 9.4.1	Same as 9.4.1	Same as 9.4.1
9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	Same as 9.4.1	Same as 9.4.1	Same as 9.4.1
9.5.1 E-UTRAN FDD – UTRA TDD P-CCPCH RSCP absolute accuracy	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -54.1dBm/1.28MHz Ior / Ioc: 2.0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB Reported PCCPCH RSCP accuracy values: ±8dB for normal conditions and ±11dB for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -75.2dBm/1.28MHz Ior / Ioc: 5.0dB	Test 1: 0dB 0dB -0.8dB 0dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB	Test 1: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -54.9dBm/1.28MHz Ior / Ioc: 2.0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB PCCPCH RSCP 51 to PCCPCH RSCP 68 for normal conditions. PCCPCH RSCP 48 to PCCPCH RSCP 71 for extreme conditions Test 2: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -75.2dBm/1.28MHz Ior / Ioc: 5.0dB

	PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB Reported PCCPCH RSCP accuracy values: ±8dB for normal conditions and ±11dB for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -97.0dBm/1.28MHz Ior / Ioc: 0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB Reported PCCPCH RSCP accuracy values: ±6dB for normal conditions and ±9dB for extreme conditions	0dB 0dB 0dB Via mapping Test 3: 0dB 0dB 0.8dB 0dB 0dB 0dB Via mapping	PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB PCCPCH RSCP 34 to PCCPCH RSCP 51 for normal conditions. PCCPCH RSCP 31 to PCCPCH RSCP 54 for extreme conditions Test 3: E-UTRA Cell 1 Noc: -98.00dBm/15kHz Ês / Noc: +4.00dB UTRA Cell 2 Ioc: -96.2dBm/1.28MHz Ior / Ioc: 0dB PCCPCH_E_C/I_{or}: -3dB DwPCH_E_C/I_{or}: 0dB PCCPCH RSCP 10 to PCCPCH RSCP 23 for normal conditions. PCCPCH RSCP 07 to PCCPCH RSCP 26 for extreme conditions
9.5.2 E-UTRAN TDD – UTRA TDD P-CCPCH RSCP absolute accuracy	Same as 9.5.1	Same as 9.5.1	Same as 9.5.1
9.6.1 GSM RSSI accuracy for E-UTRAN FDD	Subtest 1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -38.5dBm GSM Cell 3 Signal level: -38.5dBm Subtest 2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -48.5dBm GSM Cell 3 Signal level: -48.5dBm Subtest 3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -70.5dBm GSM Cell 3 Signal level: -70.5dBm Subtest 4: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -109.5dBm GSM Cell 3 Signal level: -109.5dBm Subtest 5: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -57.5dBm	Subtest 1: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 -0.2 dB GSM Cell 3 0 dB Subtest 2: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 -0.2 dB GSM Cell 3 -1.5 dB Subtest 3: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 -0.2 dB GSM Cell 3 0 dB Subtest 4: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 +0.2 dB GSM Cell 3 0 dB Subtest 5: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0.dB	Subtest 1: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -38.7dBm GSM Cell 3 Signal level: -38.5dBm Subtest 2: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -48.7dBm GSM Cell 3 Signal level: -50.0dBm Subtest 3: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -70.7dBm GSM Cell 3 Signal level: -70.5dBm Subtest 4: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -109.3dBm GSM Cell 3 Signal level: -109.5dBm Subtest 5: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -57.5dBm GSM Cell 3

	GSM Cell 3 Signal level: -54.5dBm Subtest 6: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -64.5dBm GSM Cell 3 Signal level: -59.5dBm Subtest 7: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -71.5dBm GSM Cell 3 Signal level: -64.5dBm Subtest 8: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -78.5dBm GSM Cell 3 Signal level: -69.5dBm Subtest 9: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -85.5dBm GSM Cell 3 Signal level: -74.5dBm Subtest 10: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -92.5dBm GSM Cell 3 Signal level: -79.5dBm Subtest 11: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -99.5dBm GSM Cell 3 Signal level: -84.5dBm Subtest 12: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -106.5dBm GSM Cell 3 Signal level: -89.5dBm	GSM Cell 3 0 dB Subtest 6: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 7: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 8: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 9: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 10: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 11: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB Subtest 12: E-UTRA Cell 1 0 dB 0 dB GSM Cell 2 0dB GSM Cell 3 0 dB	Signal level: -54.5dBm Subtest 6: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -64.5dBm GSM Cell 3 Signal level: -59.5dBm Subtest 7: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -71.5dBm GSM Cell 3 Signal level: -64.5dBm Subtest 8: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -78.5dBm GSM Cell 3 Signal level: -69.5dBm Subtest 9: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -85.5dBm GSM Cell 3 Signal level: -74.5dBm Subtest 10: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -92.5dBm GSM Cell 3 Signal level: -79.5dBm Subtest 11: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -99.5dBm GSM Cell 3 Signal level: -84.5dBm Subtest 12: E-UTRA Cell 1 N_{oc}: -98dBm/15kHz Ês / N_{oc}: +4dB GSM Cell 2 Signal level: -106.5dBm GSM Cell 3 Signal level: -89.5dBm
9.6.2 GSM RSSI accuracy for E-UTRAN TDD	Same as 9.6.1	Same as 9.6.1	Same as 9.6.1

9.9.1.1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Noc: -122dBm to -118.5dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±6dB	1.6dB 0dB Via mapping	Noc: -120.4dBm to -116.9dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB RSRP_9 to RSRP_24 RSRP_10 to RSRP_25 RSRP_10 to RSRP_25 RSRP_11 to RSRP_26 RSRP_12 to RSRP_27 RSRP_12 to RSRP_27 depending on operating band
9.9.1.1_1 FDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Noc: -122dBm to -118.5dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±4.5dB for normal condition ±9dB for extreme condition	1.6dB 0dB Via mapping	Noc: -120.4dBm to -116.9dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Normal condition: RSRP_10 to RSRP_22 RSRP_11 to RSRP_23 RSRP_11 to RSRP_23 RSRP_12 to RSRP_24 RSRP_12 to RSRP_24 RSRP_13 to RSRP_25 RSRP_14 to RSRP_26 depending on operating band Extreme condition: RSRP_6 to RSRP_27 RSRP_6 to RSRP_27 RSRP_7 to RSRP_28 RSRP_7 to RSRP_28 RSRP_8 to RSRP_29 RSRP_9 to RSRP_30 RSRP_9 to RSRP_30 depending on operating band
9.9.1.2 FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	N_{oc}: -122dBm to -118.5dBm /15kHz depending on operating band $Ês_1$ / N_{oc}: -4.0dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	1.6dB 0dB Via mapping	N_{oc}: -120.4dBm to -116.9dBm /15kHz depending on operating band $Ês_1$ / N_{oc}: -4.0dB RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC)
9.9.2.1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	Noc: -122dBm to -120dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±6dB	1.6dB 0dB Via mapping	Noc: -120.4dBm to -118.4dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB RSRP_9 to RSRP_24 RSRP_10 to RSRP_25 RSRP_12 to RSRP_27 depending on operating band
9.9.2.1_1 TDD Intra Frequency Serving Cell Absolute RSRP Accuracy (Rel 12 and forward)	Noc: -122dBm to -120dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRP values: ±4.5dB for normal condition ±9dB for extreme condition	1.6dB 0dB Via mapping	Noc: -120.4dBm to -118.4dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Normal condition: RSRP_10 to RSRP_22 RSRP_11 to RSRP_23 RSRP_12 to RSRP_24 depending on operating band Extreme condition: RSRP_6 to RSRP_27 RSRP_7 to RSRP_28 RSRP_8 to RSRP_29 depending on operating band
9.9.2.2 TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	Noc: -122dBm to -120dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	1.6dB 0dB Via mapping	Noc: -120.4dBm to -118.4dBm /15kHz depending on operating band Ês1 / Noc: -4.0dB RSRQ_00 to RSRQ_15 (NTC) RSRQ_00 to RSRQ_16 (ETC)
10.2 E-UTRAN FDD –	SNRs as specified	0.6dB	During T1:

Initiation/Cease of SLSS Transmission with ProSe Direct Communication			Formula: SNR + TT During T2: Formula: SNR - TT During T3: Formula: SNR+ TT
10.4 E-UTRAN FDD – Initiation/Cease of SLSS Transmission with ProSe Direct Communication	During T1: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -infinity SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0dB During T2: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -3.0dB SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0dB	During T1: EUTRA Cell: 0dB 0dB SyncRef UE: 0dB 0dB During T2: EUTRA Cell 0dB 0.6 dB SyncRef UE : 0dB 0dB	During T1: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -infinity SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0dB During T2: E-UTRA Cell Noc: -98dBm /15kHz Ês / Noc: -2.4dB SyncRef UE Noc: -98dBm /15kHz Ês / Noc: 13.0 dB

Annex G (normative): Statistical Testing

G.1 General

FSS

G.2 Statistical testing of delay and UE measurement performance in RRM tests

G.2.1 General

The RRM tests are either of deterministic or of statistical nature. The pass fail limits in tests of statistical nature are expressed as a limit (e.g. delay limit) and a success ratio applicable for the limit. The success ratio is 90% uniform (the complement is the error ratio ER = 10%).

G.2.2 Design of the test

The test is defined by the following design principles (see TS 36.521-1 clause G.X, Theory):

1) The early decision concept is applied.

2) A second limit is introduced: bad DUT factor M>1

To decide the test pass:

Supplier risk is applied based on the bad DUT quality

To decide the test fails

Customer risk is applied based on the specified DUT quality

The test is defined by the following parameters:

1) Limit ER = 0.1 (success ratio = 90%)

2) Bad DUT factor M=1.5 (selectivity)

3) Confidence level CL = 95% (for specified DUT and bad DUT-quality)

G.2.3 Numerical definition of the pass fail limits

Table G.2.3-1: pass fail limits

ne	ns_p	ns_f	ne	ns_p	ns_f	ne	ns_p	ns_f	ne	ns_p	ns_f
0	33	NA	43	408	283	86	737	644	129	1056	1021
1	46	NA	44	416	291	87	745	653	130	1064	1030
2	58	2	45	424	299	88	752	661	131	1071	1039
3	69	5	46	432	307	89	760	670	132	1078	1048
4	79	8	47	440	315	90	767	679	133	1086	1057
5	89	12	48	447	324	91	775	687	134	1093	1066
6	99	17	49	455	332	92	782	696	135	1100	1074
7	109	22	50	463	340	93	790	705	136	1108	1083
8	118	27	51	471	348	94	797	713	137	1115	1092
9	127	33	52	478	356	95	804	722	138	1122	1101
10	136	39	53	486	365	96	812	731	139	1130	1110
11	145	45	54	494	373	97	819	739	140	1137	1119
12	154	51	55	502	381	98	827	748	141	1144	1128
13	163	58	56	509	389	99	834	757	142	1152	1137
14	172	64	57	517	398	100	842	766	143	1159	1147
15	180	71	58	525	406	101	849	774	144	1166	1155
16	189	78	59	532	414	102	857	783	145	1174	1164
17	197	85	60	540	423	103	864	792	146	1181	1173
18	206	92	61	548	431	104	871	801	147	NA	1182
19	214	99	62	555	440	105	879	809	148		
20	223	106	63	563	448	106	886	818	149		
21	231	113	64	571	456	107	894	827	150		
22	239	120	65	578	465	108	901	836	151		
23	248	128	66	586	473	109	909	844	152		
24	256	135	67	594	482	110	916	853	153		
25	264	142	68	601	490	111	923	862	154		
26	272	150	69	609	499	112	931	871	155		
27	281	157	70	616	507	113	938	880	156		
28	289	165	71	624	516	114	946	888	157		
29	297	173	72	632	524	115	953	897	158		
30	305	180	73	639	533	116	960	906	159		
31	313	188	74	647	541	117	968	915	160		
32	321	196	75	654	550	118	975	924	161		
33	329	204	76	662	558	119	983	933	162		
34	337	211	77	669	567	120	990	941	163		
35	345	219	78	677	575	121	997	950	164		
36	353	227	79	684	584	122	1005	959	165		
37	361	235	80	692	592	123	1012	968	166		
38	369	243	81	700	601	124	1019	977	167		
39	377	251	82	707	610	125	1027	986	168		
40	385	259	83	715	618	126	1034	994	169		
41	393	267	84	722	627	127	1042	1003			
42	400	275	85	730	635	128	1049	1012			

The first column is the number of errors (ne = number of exceeded delays or number of wrong reports)

The second column is the number of samples for the pass limit (ns_p, ns=Number of samples= number of successes + number of exceedings or number of reports)

The third column is the number of samples for the fail limit (ns_f)

G.2.4 Pass fail decision rules

The pass fail decision rules apply for a single test, comprising one component in the test vector. The over all Pass /Fail conditions are defined in clause G.2.6

Having observed 0 errors, pass the test at 33+ samples, otherwise continue

Having observed 1 error, pass the test at 46+ samples, otherwise continue

Having observed 2 errors, pass the test at 58+ samples, fail the test at 2 samples, otherwise continue

Having observed 146 errors, pass the test at 1181+ samples, fail the test at 1173- samples, otherwise continue

Having observed 147 errors, fail the test at 1182- samples,

Where x+ means: x or more, x- means x or less

NOTE 1: an ideal DUT passes after 33 samples. The maximum test time is 1181 samples.

G.2.5 Void

G.2.6 Test conditions for delay tests and UE measurement performance

Table G.2.6-1: test conditions

Test	Statistical independence	Number of components in the test vector, as specified in the test requirements and initial conditions of the applicable test	-	Over all Pass/Fail condition
All tests in clauses 4, 5, 6.1, 7.2, 7.3 and 8 are delay tests of statistical nature while 6.2 and 7.1 are not applicable, since deterministic.	Test procedure in all statistical tests ensures independency	1 per operating band (if tested, see 3A.3.3)		Full set of environmental conditions (5) per operating band
All tests in clause 9 are UE level reports of statistical nature	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band		Full set of environmental conditions (5) per operating band

G.X Theory to derive the numbers in Table G.2.3-1 (informative)

TS 36.521-1 Annex G.X applies

Annex H (normative): Default Message Contents

This annex contains the default values of common messages specific to RRM, other than those described in TS 36.508 [7]. The message contents shall apply to test cases accordingly and unless indicated otherwise in specific test cases, shall be transmitted and checked by the system simulator. The default message contents can be defined for FDD Mode, or TDD Mode or both FDD/TDD Modes. All the messages are listed in alphabetical order based on conformance tests.

NOTE: For example, test case 8.1.1 has an exception for RRCConnectionReconfiguration message and therefore uses message contents according to TS 36.508 [7] with the exception of the RRCConnectionReconfiguration message specified in Annex H.

H.1 Common contents of system information messages exceptions

This clause contains the default values of common system information messages, other than those described in TS 36.508 [7].

H.2 Common contents of system information blocks exceptions

This clause contains the default values of common system information blocks, other than those described in TS 36.508 [7].

H.2.1 System information blocks message contents exceptions for E-UTRAN intra frequency cell re-selection

SystemInformationBlockType3: (FDD/TDD) for E-UTRAN intra-frequency cell re-selection

Table H.2.1-1: *SystemInformationBlockType3*: E-UTRAN intra frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionInfoCommon SEQUENCE {			
q-Hyst	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			

SystemInformationBlockType4: (FDD/TDD) for E-UTRAN intra-frequency cell re-selection

For Cell 2

Table H.2.1-2: *SystemInformationBlockType4*: E-UTRAN intra frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType4			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
IntraFreqNeighCellInfo ::= SEQUENCE {			
physCellId	0 (Cell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

H.2.2 System information blocks message contents exceptions for E-UTRAN inter frequency cell re-selection

SystemInformationBlockType3: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection

Table H.2.2-1: *SystemInformationBlockType3*: E-UTRAN inter frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1	Cell 1
	Not Present		Cell 2
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	4		Cell 1
	5		Cell 2
}			

SystemInformationBlockType5: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection case

For Cell 1

Table H.2.2-2: *SystemInformationBlockType5*: E-UTRAN inter frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
cellReselectionPriority[*n*]	5 for cell 1		
}			

For Cell 2

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
cellReselectionPriority[*n*]	4 for cell 2		
}			
interFreqNeighCellList[*n*] SEQUENCE (SIZE (1..maxCellInter)) OF SEQUENCE {			
physCellId	0 (Cell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			

H.2.3 System information blocks message contents exceptions for E-UTRAN inter-RAT cell re-selection

SystemInformationBlockType3: for inter-RAT EUTRAN FDD - UTRA FDD is of higher priority cell re-selection

Table H.2.3-1: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1 (E-UTRA)	
}			

SystemInformationBlockType6: for inter-RAT EUTRAN FDD - UTRA FDD is of higher priority cell re-selection

Table H.2.3-2: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-High	20 (40 dB)	40 is actual value in dB (20 * 2 dB)	
q-RxLevMin	-58 (-115 dBm)	-115 is actual value in dBm (-58 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)	Default value in TS 36.508	
q-QualMin	-20 (-20 dB)		
cellReselectionPriority[*n*]	5	UTRA is of higher priority than E-UTRAN	
}			

SystemInformationBlockType3: for inter-RAT EUTRAN TDD - UTRA TDD is of higher priority cell re-selection

Table H.2.3-3: *SystemInformationBlockType3*: Inter-RAT E-UTRAN TDD - UTRA TDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	23 (46 dB)	46 is actual value in dB (23 * 2 dB); for Cell 1 (E-UTRA)	
}			

SystemInformationBlockType6: for inter-RAT EUTRAN TDD - UTRA TDD is of higher priority cell re-selection

Table H.2.3-4: *SystemInformationBlockType6*: Inter-RAT E-UTRAN TDD - UTRA TDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			UTRA-TDD
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
cellReselectionPriority[*n*]	5	UTRA is of higher priority than E-UTRAN	
}			

SystemInformationBlockType3: for inter-RAT EUTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Table H.2.3-5: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Table H.2.3-6: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low	21 (42 dB)	42 is actual value in dB (21 * 2 dB)	
q-RxLevMin	-58 (-115 dBm)	-115 is actual value in dBm (-58 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
q-QualMin	-20 (-20 dB)		
}			

SystemInformationBlockType3: for inter-RAT EUTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Table H.2.3-7: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	23 (46 dB)	46 is actual value in dB (23 * 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Table H.2.3-8: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			UTRA-TDD
threshX-Low	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
}			

SystemInformationBlockType3: (FDD/TDD) for inter-RAT E-UTRAN - GSM cell re-selection

Table H.2.3-9: *SystemInformationBlockType3*: Inter-RAT E-UTRAN - GSM cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	4		

SystemInformationBlockType7: (FDD/TDD) for inter-RAT E-UTRAN - GSM cell re-selection

Table H.2.3-10: *SystemInformationBlockType7*: Inter-RAT E-UTRAN - GSM cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-6 SystemInformationBlockType7			
Information Element	Value/remark	Comment	Condition
commonInfo SEQUENCE {			
cellReselectionPriority	0		
ncc-Permitted	'11111111'B		
q-RxLevMin	5 (-105 dBm)	-105 is actual value in dBm (5 * 2 - 115 dBm)	
p-MaxGERAN	23 (23 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	24 (24 dBm)		DCS 1800 & PCS 1900
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
threshX-Low	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	

SystemInformationBlockType3: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Table H.2.3-11: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	1		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)	For RF/RRM test cases	
s-IntraSearch	Not present		
t-ReselectionEUTRA	0		

SystemInformationBlockType8: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Table H.2.3-12: *SystemInformationBlockType8*: Inter-RAT E-UTRAN FDD/TDD - HRPD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-7 SystemInformationBlockType8			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionParametersHRPD SEQUENCE {			
bandClassList SEQUENCE (SIZE (1..maxCDMA -BandClass)) OF SEQUENCE {	1 entry		
cellReselectionPriority	0		
threshX-High	60(-30)	INTEGER (0..63)	
threshX-Low	28(-14)	INTEGER (0..63)	
}			
}			
t-ReselectionCDMA2000	0	INTEGER (0..7)	
}			

System Information Block Type 3: for E-UTRAN to UTRAN inter-RAT cell re-selection

Table H.2.3-13: System Information Block type3: Inter-RAT E-UTRAN FDD/TDD - UTRAN FDD cell re-selection

Derivation Path: 34.108 clause 6.1.0b			
Information Element	**Value/remark**	**Comment**	**Condition**
- Cell selection and reselection info			
- Qqualmin	-20		
- Qrxlevlmin	-58 (-115dBm)		
- Maximum allowed UL TX power	21		

Table H.2.3-14: System Information Block type 3 (1.28 Mcps TDD): inter-RAT E-UTRAN FDD/TDD – UTRAN TDD cell re-selection

Derivation Path: 34.108 clause 6.1.0b			
Information Element	**Value/remark**	**Comment**	**Condition**
- SIB4 Indicator	TRUE		
- Cell identity	0000 0000 0000 0000 0000 0000 0001B		
- Cell selection and re-selection info			
- Mapping info	Not present		
- Cell selection and reselection quality measure	(no data)		
- CHOICE mode	TDD		
- Sintrasearch	10 dB		
- Sintersearch	10 dB		
- SsearchHCS	Not present		
- RAT List	Not present		
- Qrxlevmin	-103 dBm		
- $Qhyst1_s$	0 dB		
- Treselections	0 seconds		
- HCS Serving cell information	Not present		

SystemInformationBlockType3: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Table H.2.3-15: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	1		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)	For RF/RRM test cases	
s-IntraSearch	Not present		
t-ReselectionEUTRA	0		
}			

SystemInformationBlockType8: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Table H.2.3-16: *SystemInformationBlockType8*: Inter-RAT E-UTRAN FDD/TDD – cdma2000 1xRTT is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-7 SystemInformationBlockType8			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionParameters1XRTT SEQUENCE {			1XRTT
longCodeState1XRTT	Not Present		
cellReselectionParameters1XRTT SEQUENCE {			
bandClassList SEQUENCE (SIZE (1..maxCDMA -BandClass)) OF SEQUENCE {	1 entry		
cellReselectionPriority	0		
threshX-High	60(-30)	INTEGER (0..63)	
threshX-Low	56(-28)	INTEGER (0..63)	
}			
t-ReselectionCDMA2000	0	INTEGER (0..7)	
t-ReselectionCDMA2000-SF	Not Present		
}			
}			
}			

H.2.4 System information blocks message contents exceptions for E-UTRAN radio link monitoring (RLM)

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Radio Link Monitoring test for out-of-sync

Table H.2.4-1: *SystemInformationBlockType2*: E-UTRAN Radio Link Monitoring test for out-of-sync

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
radioResourceConfigCommon SEQUENCE {			
pdsch-ConfigCommon SEQUENCE {			
referenceSignalPower	Set to an arbitrarily selected value above -11dBm and within the IE allowed range described in 36.331[5]	The selected IE value depends on the test system implementation and should be declared in the test report.	
}			
soundingRS-UL-ConfigCommon CHOICE {			
release	NULL		
}			
}			
ue-TimersAndConstants {			
t300	ms1000		
t301	ms1000		
t310	ms0		
n310	n1		
t311	ms1000		
n311	n1		
}			

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Radio Link Monitoring test for in-sync

Table H.2.4-2: *SystemInformationBlockType2*: E-UTRAN Radio Link Monitoring test for in-sync

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
radioResourceConfigCommon SEQUENCE {			
pdsch-ConfigCommon SEQUENCE {			
referenceSignalPower	Set to an arbitrarily selected value above -11dBm and within the IE allowed range described in 36.331[5]	The selected IE value depends on the test system implementation and should be declared in the test report.	
}			
soundingRS-UL-ConfigCommon CHOICE {			
release	NULL		
}			
}			
ue-TimersAndConstants {			
t300	ms1000		
t301	ms1000		
t310	ms2000		
n310	n1		
t311	ms1000		
n311	n1		
}			

H.2.5 System information blocks message contents exceptions for RRC Re-establishment

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Intra-frequency RRC Re-establishment

Table H.2.5-1: *SystemInformationBlockType2*: E-UTRAN FDD Intra-frequency RRC Re-establishment

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t310	ms0		
t311	ms3000		
n310	n1		
n311	n1		

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Inter-frequency RRC Re-establishment

Table H.2.5-2: *SystemInformationBlockType2*: E-UTRAN FDD Inter-frequency RRC Re-establishment

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t310	ms0		
t311	ms5000		
n310	n1		
n311	n1		

H.2.6 System information block messages and information elements contents exceptions for E-UTRAN Random Access

SystemInformationBlockType1: (FDD/TDD) for E-UTRAN random access

Table H.2.6-1: *SystemInformationBlockType1*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table H.2.6-1a: *SystemInformationBlockType1-BR-r13*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3A SystemInformationBlockType1-BR-r13			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1-BR-r13 ::= SEQUENCE {			
p-Max	23 (dBm)		

RACH-ConfigCommon-DEFAULT: (FDD/TDD) for E-UTRAN random access

Table H.2.6-2: *RACH-ConfigCommon-DEFAULT*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
preamblesGroupAConfig SEQUENCE {}	Not present		
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
ra-SupervisionInfo SEQUENCE {			Cat-M1 UE
preambleTransMax	n6		
}			
maxHARQ-Msg3Tx	4		
}			
RAR-HoppingConfigInfo-r13 [1] SEQUENCE {			
rar-HoppingConfig	off		
}			

PDSCH-ConfigCommon-DEFAULT: (FDD/TDD) for E-UTRAN random access

Table H.2.6-3: *PDSCH-ConfigCommon-DEFAULT*: E-UTRAN FDD/TDD - Contention and Non-Contention Based Random Access

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-5 PDSCH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PDSCH-ConfigCommon-DEFAULT ::= SEQUENCE {			
referenceSignalPower	-5 (dBm)		1TX

H.2.7 System information blocks message contents exceptions for eICIC/feICIC

SystemInformationBlockType2: (FDD/TDD) for eICIC/feICIC

Table H.2.7-1: *SystemInformationBlockType2*: Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC/feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType2 ::= SEQUENCE {			
mbsfn-SubframeConfiguration	Not present		
}			

SystemInformationBlockType3: (FDD) for eICIC/feICIC

Table H.2.7-2: *SystemInformationBlockType3*: Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC/feICIC)

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		FDD with E-UTRA FDD neighbour cell

H.3 Default RRC messages and information elements contents exceptions

This clause contains the default values of common sRRC messages and information elements, other than those described in TS 36.508 [7].

H.3.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration

RRCConnectionReconfiguration: (FDD/TDD) to setup E-UTRAN Measurement Configuration

Table H.3.1-1: *RRCConnectionReconfiguration*: E-UTRAN Measurement Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		MEAS
}			
}			
}			
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for intra frequency measurement

Table H.3.1-2: *MeasConfig-DEFAULT*: E-UTRAN intra frequency measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table H.3.1-2a: *MeasConfig-DEFAULT*: E-UTRAN intra frequency measurement configuration for Cat-M1 UE

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for inter frequency handover

Table H.3.1-3: *MeasConfig-DEFAULT*: E-UTRAN inter frequency measurement configuration for inter frequency handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {		f1 is the frequency of the serving cell	
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to UTRAN cell search

Table H.3.1-4: *MeasConfig-DEFAULT*: interRAT UTRAN measurement configuration for E-UTRAN to UTRAN cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell (E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to UTRAN handover

Table H.3.1-5: *MeasConfig-DEFAULT*: interRAT UTRAN measurement configuration for E-UTRAN to UTRAN handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(UTRA Cell)	
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f2)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-B2		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to GSM handover

Table H.3.1-6: *MeasConfig-DEFAULT*: interRAT GSM measurement configuration for E-UTRAN to GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f2)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

QuantityConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for L3 filtering is not used

Table H.3.1-7: QuantityConfig-DEFAULT: measurement configuration for L3 filtering is not used

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigUTRA SEQUENCE {}	Not present		
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-FDD	cpich-EcN0		
measQuantityUTRA-TDD	pccpch-RSCP		
filterCoefficient	fc0		
}			
quantityConfigGERAN SEQUENCE {}	Not present		
quantityConfigGERAN SEQUENCE {			GERAN
measQuantityGERAN	rssi		
filterCoefficient	fc0		
}			
quantityConfigCDMA2000 SEQUENCE {}	Not present		
quantityConfigCDMA2000 SEQUENCE {			CDMA2000
measQuantityCDMA2000	pilotStrength		
}			
}			

Condition	Explanation
UTRAN	For inter-RAT measurements with UTRAN
GERAN	For inter-RAT measurements with GERAN
CDMA2000	For inter-RAT measurements with CDMA2000

Table H.3.1-8: *MeasConfig-DEFAULT*: interRAT HRPD measurement configuration for E-UTRAN to HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(CDMA2000 Cell)	
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	IdReportConfig-B2		
}			
quantityConfig	QuantityConfig-DEFAULT		CDMA2000
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for inter frequency measurement

Table H.3.1-9: *MeasConfig-DEFAULT*: E-UTRAN inter frequency measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN to GSM cell search

Table H.3.1-10: *MeasConfig-DEFAULT*: interRAT GSM measurement configuration for E-UTRAN to GSM cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	7 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f2)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f3)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f4)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f5)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			

measObjectGERAN	MeasObjectGERAN-GENERIC(f6)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f7)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurement periodical configuration for E-UTRAN to GSM cell search

Table H.3.1-11: *MeasConfig-DEFAULT*: interRAT GSM measurement periodical configuration for E-UTRAN to GSM cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	7 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell(E-UTRA Cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f2)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3	f3 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f3)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f4	f4 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f4)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f5	f5 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f5)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f6	f6 is the frequency of the neighbouring cell(GERAN Cell)	

measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f6)	GERAN Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f7	f7 is the frequency of the neighbouring cell(GERAN Cell)	
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f7)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigInterRAT-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-P		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

H.3.2 RRC messages and information elements contents exceptions for E-UTRAN cell re-selection and handover

PRACH-Config-DEFAULT: (FDD) for cell re-selection and handover

Table H.3.2-1: *PRACH-Config-DEFAULT*: E-UTRAN FDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		

PRACH-Config-DEFAULT: (TDD) for cell re-selection and intra frequency / inter frequency handover

Table H.3.2-2: *PRACH-Config-DEFAULT*: E-UTRAN TDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigInfo SEQUENCE {			
prach-ConfigIndex	53		

RRCConnectionReconfiguration: (FDD/TDD) for intra-frequency / inter-frequency handover

Table H.3.2-3: *RRCConnectionReconfiguration*: E-UTRAN handover Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
mobilityControlInfo			
}	MobilityControlInfo-HO		HO
}			
}			
}			

H.3.3 RRC messages and information elements contents exceptions for E-UTRAN inter-RAT handover

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN - UTRAN handover

Table H.3.3-1: *Handover*: Inter-RAT E-UTRAN - UTRAN handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	utra	ENUMERATED {utra, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	
targetRAT-MessageContainer		OCTET STRING	
nas-SecurityParamFromEUTRA		OCTET STRING(SIZE (1))	UTRAGERAN
}			

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN - GSM handover

Table H.3.3-2: *Handover*: Inter-RAT E-UTRAN - GSM handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	geran	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	
targetRAT-MessageContainer		OCTET STRING	
nas-SecurityParamFromEUTRA		OCTET STRING(SIZE (1))	UTRAGERAN
}			

MobilityFromEUTRACommand: (FDD/TDD) to setup Inter-RAT E-UTRAN handover

Table H.3.3-3: *MobilityFromEUTRACommand*: Inter-RAT E-UTRAN handover

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-6 MobilityFromEUTRACommand			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE {			
mobilityFromEUTRACommand-r8 SEQUENCE {			
csFallbackIndicator	FALSE		
purpose CHOICE {			
Handover	Handover		
}			
nonCriticalExtension SEQUENCE {}	Not present		
nonCriticalExtension SEQUENCE {			GERAN
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {			
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			
}			
}			

Condition	**Explanation**
GERAN	The field should be present if the *purpose* is set to "*handover*" and the *targetRAT-Type* is set to "*geran*"; otherwise the field is not present

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN – HRPD handover

Table H.3.3-4: *Handover*: Inter-RAT E-UTRAN – HRPD handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	cdma2000-HRPD	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	

H.3.4 RRC messages and information elements exceptions for E-UTRAN UE transmit timing accuracy and UE timing advance adjustment accuracy

RRCConnectionReconfiguration: (FDD/TDD) to establish E-UTRAN Radio Resource Configuration

Table H.3.4-1: *RRCConnectionReconfiguration*: E-UTRAN Radio Resource Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
Rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
C1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated			
	RadioResourceConfigDedicated-HO-TO-EUTRA(n,m)		HO-TO-EUTRA(n,m)

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) for E-UTRAN Physical Configuration

Table H.3.4-2: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN Physical Configuration

Derivation Path: TS 36.508 [7] clause 4.8.21.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated			SRB1
	SoundingRS-UL-ConfigDedicated-DEFAULT		RBC
antennaInformation CHOICE {			
defaultValue	NULL		
}			
schedulingRequestConfig	Not present		SRB1

H.3.5 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN intra frequency RSRP and RSRQ accuracy

Table H.3.5-1: *MeasConfig-DEFAULT*: E-UTRAN intra frequency RSRP and RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table H.3.5-1a: *MeasConfig-DEFAULT*: E-UTRAN intra frequency RSRP and RSRQ Accuracy for Cat-M1 UE

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) perform Measurement Configuration for E-UTRAN inter frequency RSRP and RSRQ accuracy

Table H.3.5-2: *MeasConfig-DEFAULT*: E-UTRAN inter frequency RSRP and RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell (inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		Gap Pattern Id = 0
	MeasGapConfig-GP2		Gap Pattern Id = 1
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy

Table H.3.5-3: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

Table H.3.5-3a: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	2		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy

Table H.3.5-4: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrq		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy

Table H.3.5-4a: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrq		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	2		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

MeasObjectEUTRA-GENERIC(Freq): (FDD/TDD) for eICIC/feICIC (Non-MBSFN ABS)

Table H.3.5-5: *MeasObjectEUTRA-GENERIC*: Time Domain Measurement Resource Restriction with Non MBSFN ABS (eICIC/feICIC)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
neighCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)		FDD with E-UTRA FDD neighbour cell
}			

H.3.6 RRC messages and information elements contents exceptions for E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency handover and E-UTRAN intra-frequency cell search with DRX_S

Table H.3.6-1: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_S

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf100		
drx-RetransmissionTimer	psf16		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for best-effort services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
}			

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency handover and E-UTRAN intra-frequency cell search with DRX_L

Table H.3.6-2: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_L

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_L
Setup SEQUENCE {			
onDurationTimer	psf6		
drx-InactivityTimer	psf1920		
drx-RetransmissionTimer	psf16		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
}			

H.3.7 RRC messages and information elements contents exceptions for E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX is used

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search when DRX = 40 ms

Table H.3.7-1: *MAC-MainConfig-RBC*: E-UTRAN inter frequency cell search and E-UTRAN intra frequency cell search when DRX = 40 ms

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search when DRX = 1280 ms

Table H.3.7-2: *MAC-MainConfig-RBC*: E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX = 1280 ms

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
}			

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search

Table H.3.7-3: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN inter frequency and E-UTRAN inter-RAT cell search

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

H.3.8 RRC messages and information elements contents exceptions for E-UTRAN CSI-RSRP Accuracy

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN intra frequency CSI-RSRP

Table H.3.8-1: *MeasConfig-DEFAULT*: E-UTRAN intra frequency CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1) using condition DS_Meas		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL-CSI-RS		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN inter frequency CSI-RSRP

Table H.3.8-2: *MeasConfig-DEFAULT*: E-UTRAN inter frequency CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1) using condition DS_Meas		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the neighbouring cell (inter frequency cell)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2) using condition DS_Meas	Inter frequency cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL-CSI-RS		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entries		
measIdToAddMod[0] SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
measIdToAddMod[1] SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN Carrier Aggregation CSI-RSRP

Table H.3.8-3: *MeasConfig-DEFAULT*: E-UTRAN Carrier Aggregation CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1) using condition DS_Meas		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2) using condition DS_Meas		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL-CSI-RS		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entries		
measIdToAddMod[0] SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
measIdToAddMod[1] SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL-CSI-RS: (FDD/TDD) for periodical configuration reporting of E-UTRAN CSI-RSRP accuracy

Table H.3.8-4: *ReportConfigEUTRA-PERIODICAL-CSI-RS*: E-UTRAN CSI-RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-12 ReportConfigEUTRA-PERIODICAL-CSI-RS			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	2		
reportInterval	ms1024		
reportAmount	infinity		
si-RequestForHO-r9	Not Present		
ue-RxTxTimeDiffPeriodical-r9	Not Present		
includeLocationInfo-r10	Not Present		
reportAddNeighMeas-r10	Not Present		
alternativeTimeToTrigger-r12	Not Present		
useT312-r12	Not Present		
usePSCell-r12	Not Present		
aN-Threshold1-v1250	Not Present		
a5-Threshold2-v1250	Not Present		
reportStrongestCSI-RSs-r12	true		
reportCRS-Meas-r12	false		
triggerQuantityCSI-RS-r12	true		
}			

QuantityConfig-DEFAULT (FDD/TDD) E-UTRAN measurement configuration for E-UTRAN CSI-RSRP accuracy

Table H.3.8-5: QuantityConfig-DEFAULT: measurement configuration for E-UTRAN CSI-RSRP accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigEUTRA-v1250 SEQUENCE {			
filterCoefficientCSI-RSRP-r12	fc0		
}			
}			

MeasGapConfig-GP1 (FDD/TDD) E-UTRAN measurement gap configuration for E-UTRAN CSI-RSRP accuracy

Table H.3.8-6: MeasGapConfig-GP1: measurement configuration for E-UTRAN CSI-RSRP accuracy

Derivation Path: 36.508 [7] clause 4.6.6, Table 4.6.6-1A: MeasGapConfig-GP1			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig-GP1 ::= CHOICE {			
setup SEQUENCE {			
gapOffset CHOICE {			
gp0	9	TGRP = 40 ms	
}			
}			
}			

H.4 Default RRC messages and information elements contents exceptions for Carrier Aggregation

This clause contains the default values of common RRC messages and information elements for Carrier Aggregation, other than those described in TS 36.508 [7].

H.4.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for CA

RRCConnectionReconfiguration: (FDD/TDD) to setup E-UTRAN Measurement Configuration for CA

Table H.4.1-1: *Void*

MeasConfig-DEFAULT: (FDD/TDD) E-UTRAN Measurement Configuration for Event Triggered Reporting for CA

Table H.4.1-2: *MeasConfig-DEFAULT*: E-UTRAN Measurement Configuration for CA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2)and neighbouring cell on the SCC (Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A6		
reportConfig	ReportConfigEUTRA-A6		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A6		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasObjectEUTRA-GENERIC: (FDD/TDD) E-UTRAN Measurement Configuration for Event Triggered Reporting for CA

Table H.4.1-3: *MeasObjectEUTRA-GENERIC(Freq)*: E-UTRAN Measurement Configuration for CA with SCell measurement cycle 1280 ms)

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighbourCellConfig	'01'B (No MBSFN subframes are present in all neighbour cells)	MBSFN doesn't apply by default.	TDD
	10'B (The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cell)		FDD
offsetFreq	0 (dB 0)		
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
measCycleSCell-r10	sf1280		
measSubframePatternConfigNeigh-r10	Not present		
}			

Table H.4.1-4: Void

MeasurementReport: (FDD/TDD) E-UTRAN Measurement Report for CA and DC

Table H.4.1-5: MeasurementReport: E-UTRAN Measurement Report for CA and DC

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour cell	
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

Table H.4.1-5a: MeasurementReport: E-UTRAN Measurement Report for CA and DC without Neigh Cells

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			

ReportConfigEUTRA-A6: (FDD/TDD) E-UTRAN Measurement Report Configuration for Event A6 for CA

Table H.4.1-6: ReportConfig-A6: E-UTRAN Report config for Event A6 for CA

Derivation Path: TS 36.508 [7] clause 4.6.6 table 4.6.6-6A			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A6 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA6-r10 SEQUENCE {			
a6-Offset-r10	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	A6-Offset = -3dB
	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	A6-Offset = -6dB
a6-ReportOnLeave-r10	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0		
}			
}			
triggerQuantity	rsrp		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms5120		
reportAmount	r1		
}			

MeasurementReport: (FDD/TDD) E-UTRAN RSRP Measurement Report for 3CA

Table H.4.1-7: MeasurementReport: E-UTRAN RSRP Measurement Report for 3CA

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Neighbour cell	
MeasResultEUTRA SEQUENCE {			
physCellId	physCellId of Neighbour Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 4	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

MeasurementReport: (FDD/TDD) E-UTRAN RSRQ Measurement Report for 3CA

Table H.4.1-8: MeasurementReport: E-UTRAN RSRQ Measurement Report for 3CA

Derivation path: TS 36.508 [7] clause 4.6.1 table 4.6.1-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {	2 entries		
MeasResultServFreq-r10[1] {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell Cell 2	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
MeasResultServFreq-r10[2] {			
servFreqId-r10	2		
measResultSCell-r10 SEQUENCE {		SCell Cell 3	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			
}			
}			
}			
}			

H.4.2 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy for CA

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN RSRP and RSRQ accuracy for CA

Table H.4.2-1: *MeasConfig-DEFAULT*: E-UTRAN RSRP and RSRQ Accuracy for CA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entries		
MeasObjectToAddMod[1] SEQUENCE {			
measObjectId	IdMeasObject-f1	f1 is the frequency of the PCell (Cell 1)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
measObjectId	IdMeasObject-f2	f2 is the frequency of the PCell (Cell 1)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {			
measObjectId	IdMeasObject-f2	f2 is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
measObjectId	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC(Cell 3)	Switch PCell/SCell scenario
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2	f2 is the frequency	

		of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC (Cell 3)	
	IdMeasObject-f1	f1 is the frequency of the SCell on the SCC (Cell 2) and neighbouring cell on the SCC (Cell 3)	Switch PCell/SCell scenario
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy for CA

Table H.4.2-2: Void

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy for CA

Table H.4.2-3: Void

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP and RSRQ accuracy for CA

Table H.4.2-4: Void

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy for 3CA

Table H.4.2-5: *MeasConfig-DEFAULT*: E-UTRAN RSRP Accuracy for 3CA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
MeasObjectToAddMod[n] SEQUENCE {			
measObjectId	IdMeasObject-f(n)	f(n), n=1,2,…N is the frequency of the PCell and Scells according to Annex E	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f(n))		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
measIdToAddMod ::= SEQUENCE {			
measId	n	n denotes the index of the entry. n=1,2,…N	
measObjectId	IdMeasObject-f(n)		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy for 3CA

Table H.4.2-6: *MeasConfig-DEFAULT*: E-UTRAN RSRQ Accuracy for 3CA

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	N entries	N is E-UTRA RF Channel Number used in the test	
MeasObjectToAddMod[n] SEQUENCE {			
measObjectId	IdMeasObject-f(n)	f(n) , n=1,2,…N is the frequency of the PCell and Scells according to Annex E	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f(n))		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entries		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f(1)		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

H.5 Default RRC messages and information elements contents exceptions for FeICIC

This clause contains the default values of common RRC messages and information elements for FeICIC, other than those described in TS 36.508 [7].

H.5.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for FeICIC

RadioResourceConfigDedicated-SRB2-DRB(n, m): (FDD/TDD) E-UTRAN measurement configuration for NeighCells-Info-r11

Table H.5.1-1: *RadioResourceConfigDedicated-SRB2-DRB(n, m)*: NeighCellsCRS-Info

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16			
Information Element	**Value/remark**	**Comment**	**Condition**
neighCellsCRS-Info-r11 ::= CHOICE {			
NeighCellsCRS-Info-r11 ::= CHOICE {			
setup	CRS-AssistanceInfoList-r11		
}			
}			

RadioResourceConfigDedicated-SRB2-DRB(n, m): (FDD/TDD) E-UTRAN measurement configuration for CRS-AssistancecInfoList-r11

Table H.5.1-2: *RadioResourceConfigDedicated-SRB2-DRB(n, m)*: CRS-AssistanceInfoList-r11

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16			
Information Element	**Value/remark**	**Comment**	**Condition**
CRS-AssistancedInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11			
CRS-AssistancedInfo-r11 ::= SEQUENCE {			
physCellId-r11	$(PCI_{cell1} - PCI_{cell3})mod6 = 0$ $(PCI_{cell2} - PCI_{cell3})mod6 != 0$	Cell PCIs are selected so that both conditions are met	
antennaPortsCount-r11	an1		
mbsfn-SubframeConfigList-r11	MBSFN-SubframeConfigList		
}			

RadioResourceConfigDedicated-SRB2-DRB(n, m): (FDD/TDD) E-UTRAN measurement configuration for MBSFN-SubframeConfigList

Table H.5.1-3: *RadioResourceConfigDedicated-SRB2-DRB(n, m)*: MBSFN-SubframeConfigList

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-16			
Information Element	**Value/remark**	**Comment**	**Condition**
MBSFN-SubframeConfigList ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-SubframeConfig			
MBSFN-SubframeConfig:: = SEQUENCE {			
radioframeAllocationPeriod	n1		
radioframeAllocationOffset	0		
subframeAllocation CHOICE {			
oneFrame	'000000'	Only the CRS information of Cell 2 is provided in CRS-AssistanceInfo. It includes a single MBSFN-SubframeConfig element with subframe allocation *one Frame*='000000' BIT STRING (SIZE(6))	
}			
}			

H.5.2 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy for FeICIC

MeasurementReport: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP and RSRQ accuracy for FeICIC

Table H.5.2-1: *MeasurementReport*: E-UTRAN RSRP and RSRQ Accuracy for FeICIC

Derivation path: TS 36.508 [7] clause 4.6.1 Table 4.6.1-5 MeasurementReport			
Information Element	**Value/Remark**	**Comment**	**Condition**
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
measurementReport-r8 SEQUENCE {			
measResults ::= SEQUENCE {			
measId	1		
measResultPCell::= SEQUENCE {		PCell	
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
MeasResultEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultEUTRA SEQUENCE {			
physCellId	physCellId of best Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
MeasResultEUTRA SEQUENCE {			
physCellId	physCellId of 2nd best Cell		
cgi-Info	Not present		
measResult SEQUENCE {			
rsrpResult	(0..97)	Set according to specific test	
rsrqResult	(0..34)	Set according to specific test	
}			
}			
}			
}			
measResultForECID-r9	Not present		
locationInfo-r10	Not present		
measResultServFreqList-r10 SEQUENCE (SIZE (1..maxServCell-r10)) OF SEQUENCE {			
servFreqId-r10	1		
measResultSCell-r10 SEQUENCE {		SCell	
rsrpResultSCell-r10	(0..97)	Set according to specific test	
rsrqResultSCell-r10	(0..34)	Set according to specific test	
}			
}			
}			
}			

}			
}			

H.6 Default RRC messages and information elements contents exceptions for Proximity based services

This clause contains the default values of common RRC messages and information elements for Proximity based services, other than those described in TS 36.508 [7].

H.6.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration for Proximity based services

H.6.1.1 Reference resource pool configurations for ProSe Direct Discovery

Table H.6.1.1-1: ProSe Direct Discovery configuration for E-UTRA FDD (Configuration #1)

Information Element				Value
discRxPool	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		12
		prb-Start		0
		prb-End		23
		offsetIndicator		160
		subframeBitmap		11000000 00000000 00000000 00000000 00000000
	txParameters			not present
	rxParameters			not present
discTxPoolCommon	cp-Len			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	prb-Num		2
		prb-Start		3
		prb-End		5
		offsetIndicator		160
		subframeBitmap		10000000 00000000 00000000 00000000 00000000
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		ue-SelectedResourceConfig	poolSelection	random
			txProbability	p100
	rxParameters			not present
discTxPowerInfo	discMaxTxPower			23
SL-SyncConfig	syncCP-Len			Normal
	syncOffsetIndicator			155
	slssid			30
	txParameters	txParametersGeneral	alpha	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present
discInterFreqList				not present

Table H.6.1.1-2: ProSe Direct Discovery configuration for E-UTRA FDD (Configuration #2)

Information Element				Value
discRxPool	*cp-Len*			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	*prb-Num*		12
		prb-Start		0
		prb-End		23
		offsetIndicator		160
		subframeBitmap		11000000 00000000 00000000 00000000 00000000
	txParameters			not present
	rxParameters	*tdd-Config*		not present
		syncConfigIndex		0
discTxPoolCommon				not present
discTxPowerInfo	*discMaxTxPower*			23
SL-SyncConfig	*syncCP-Len*			Normal
	syncOffsetIndicator			140
	slssid			30
	txParameters			not present
	rxParamsNCell	*physCellId*		1
		discSyncWindow		w1
discInterFreqLis				not present

Table H.6.1.1-3: ProSe Direct Discovery configuration for E-UTRA TDD Config 0 (Configuration #3)

Information Element				Value
discRxPool	*cp-Len*			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	*prb-Num*		12
		prb-Start		0
		prb-End		23
		offsetIndicator		163
		subframeBitmap		11000000 00000000 00000000 00000000 00000000 00
	txParameters			not present
	rxParameters			not present
discTxPoolCommon	*cp-Len*			Normal
	discPeriod			rf32
	numRetx			0
	numRepetition			1
	tf-ResourceConfig	*prb-Num*		2
		prb-Start		3
		prb-End		5
		offsetIndicator		163
		subframeBitmap		10000000 00000000 00000000 00000000 00000000 00
	txParameters	*txParametersGeneral*	*alpha*	al0
			p0	31
		ue-SelectedResourceConfig	*poolSelection*	random
			txProbability	p100
	rxParameters			not present
discTxPowerInfo	*discMaxTxPower*			23
SL-SyncConfig	*syncCP-Len*			Normal
	syncOffsetIndicator			158
	slssid			30
	txParameters	*txParametersGeneral*	*alpha*	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present
discInterFreqList				not present

H.6.1.2 Reference resource pool configurations for ProSe Direct Communication

Table H.6.1.2-1: ProSe Direct Communication configuration for E-UTRA FDD (Configuration #1)

Information Element				Value (5MHz)	Value (10MHz)
commRxPool	*sc-CP-Len*			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	*prb-Num*		12	25
		prb-Start		0	0
		prb-End		23	49
		offsetIndicator		0	
		subframeBitmap		00011000 00000000 00000000 00000000 00000000	
	data-CP-Len			Normal	
	dataHoppingConfig	*hoppingParameter*		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-SelectedResourceConfig	*data-TF-ResourceConfig*	*prb-Num*	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	00000000 11111111 11111111 11111111 11111111	
		trpt-Subset-r12		001	
	rxParametersNCell			not present	
	txParameters			not present	
commTxPoolNormalCommon	*sc-CP-Len*			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	*prb-Num*		12	25
		prb-Start		0	0
		prb-End		24	49
		offsetIndicator		0	
		subframeBitmap		00011000 00000000 00000000 00000000 00000000	
	data-CP-Len			Normal	
	dataHoppingConfig	*hoppingParameter*		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-SelectedResourceConfig	*data-TF-ResourceConfig*	*prb-Num*	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	00000000 11111111 11111111 11111111 11111111	
		trpt-Subset-r12		001	
	rxParametersNCell			not present	
	txParameters	*sc-TxParameters*	*alpha*	al0	
			p0	31	
		dataTxParameters	*alpha*	al0	

			p0	31
SL-SyncConfig	*syncCP-Len*			Normal
	syncOffsetIndicator			2
	slssid			30
	txParameters	*txParametersGeneral*	*alpha*	al0
			p0	31
		syncTxThreshIC		0 (-infinity)
	rxParamsNCell			not present

Table H.6.1.2-2: ProSe Direct Communication pre-configuration for E-UTRAN FDD for out-of-network coverage operation (Configuration #2)

Information Element				Value (5MHz)	Value (10MHz)
preconfigSync	*syncCP-Len-r12*			Normal	
	syncOffsetIndicator1			2	
	syncOffsetIndicator2			1	
	syncTxParameters			31	
	syncTxThreshOoC			0 (-110dBm / 15kHz)	
	filterCoefficient			fc0	
	syncRefMinHyst			dB0	
	syncRefDiffHyst			dB0	
preconfigComm	*sc-CP-Len*			Normal	
	sc-Period			sf40	
	sc-TF-ResourceConfig	*prb-Num*		12	25
		prb-Start		0	0
		prb-End		23	49
		offsetIndicator		0	
		subframeBitmap		00011000 00000000 00000000 00000000 00000000	
	data-CP-Len			Normal	
	dataHoppingConfig	*hoppingParameter*		0	
		numSubbands		ns1	
		rb-Offset		0	
	ue-SelectedResourceConfig	*data-TF-ResourceConfig*	*prb-Num*	12	25
			prb-Start	0	0
			prb-End	23	49
			offsetIndicator	0	
			subframeBitmap	00000000 11111111 11111111 11111111 11111111	
		trpt-Subset-r12		001	

Annex I (normative): Conditions for RRM requirements applicability for operating bands

I.1 Conditions for E-UTRAN RRC_IDLE state mobility

I.1.1 Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection

This section defines the E-UTRAN intra-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection are defined in Table I.1.1-1

Table I.1.1-1: Conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-124	-124	≥ -4	≥ -4
	FDD_B	-123.5	-123.5		
	FDD_C, TDD_C	-123	-123		
	FDD_D	-122.5	-122.5		
	FDD_E, TDD_E	-122	-122		
	FDD_F	-121.5 Note 2	-121.5 Note 2		
	FDD_G	-121	-121		
	FDD_H	-120.5	-120.5		
	FDD_N	-117.5	-117.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Section I.4.2.
NOTE 2: The condition is -122 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.1.2 Conditions for measurements of inter-frequency E-UTRAN cells for cell re-selection

This section defines the E-UTRAN inter-frequency RSRP, RSRP Ês/Iot, SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for measurements of intra-frequency E-UTRAN cells for cell re-selection defined in Table I.1.1-1 also apply for inter-frequency E-UTRAN cells in this section.

I.1.3

I.1.4 Conditions for measurements of intra-frequency NB-IoT cells for cell re-selection for UE Category NB1

This clause defines the NB-IoT intra-frequency NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.1.4 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage for cell re-selection are defined in Table I.1.4-1.

The conditions for measurements of intra-frequency NB-IoT cells in enhanced coverage for cell re-selection are defined in Table I.1.4-2.

Table I.1.4-1: NB-IoT intra-frequency measurements for HD-FDD in normal coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP	Minimum NSCH_RP	NRSRP Ês/Iot	NSCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	NFDD_G	-121	-121	≥ -6	≥ -6
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.					

Table I.1.4-2: NB-IoT intra-frequency measurements for HD-FDD in enhanced coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP	Minimum NSCH_RP	NRSRP Ês/Iot	NSCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	NFDD_G	-121	-121	≥ -15	≥ -15
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.					

I.1.5 Conditions for measurements of inter-frequency NB-IoT cells for cell re-selection for UE Category NB1

This clause defines the NB-IoT inter-frequency NRSRP, NRSRP Ês/Iot, NSCH_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.1.5 is defined in Section 3.6.

The conditions for measurements of intra-frequency NB-IoT cells in normal coverage for cell re-selection defined in Table I.1.4-1 also apply for inter-frequency NB-IoT cells in normal coverage in this section.

The conditions for measurements of intra-frequency NB-IoT cells in enhanced coverage for cell re-selection defined in Table I.1.4-2 also apply for inter-frequency NB-IoT cells in enhanced coverage in this section.

I.2 Conditions for UE Measurements Procedures in RRC_CONNECTED State

I.2.1 Conditions for E-UTRAN intra-frequency measurements

This section defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band

The conditions for intra-frequency E-UTRAN measurements are defined in Table I.2.1-1

Table I.2.1-1: E-UTRAN intra-frequency measurements

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-127	≥ -6
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2. NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.			

I.2.2 Conditions for E-UTRAN intra-frequency measurements with autonomous gaps

This section defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band

The conditions for intra-frequency E-UTRAN measurements with autonomous gap are defined in Table I.2.1-1

Table I.2.2-1: Void

I.2.3 Conditions for E-UTRAN inter-frequency measurements

This section defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, RSRP and RSRP Ês/Iot applicable for a corresponding operating band

The conditions for inter-frequency E-UTRAN measurements with autonomous gap are defined in Table I.2.3-1

Table I.2.3-1: E-UTRAN inter-frequency measurements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-125	-125	≥ -4	≥ -4
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
	FDD_E, TDD_E	-123	-123		
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3. NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.					

I.2.4 Conditions for E-UTRAN inter-frequency measurements with autonomous gaps

This section defines the E-UTRAN inter-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for inter-frequency E-UTRAN measurements with autonomous gap are defined in Table I.2.4-1.

Table I.2.4-1: E-UTRAN inter-frequency measurements with autonomous gaps

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-125	≥ -4
	FDD_B	-124.5	
	FDD_C, TDD_C	-124	
	FDD_D	-123.5	
	FDD_E, TDD_E	-123	
	FDD_F	-122.5 Note 2	
	FDD_G	-122	
	FDD_H	-121.5	
	FDD_N	-118.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.5 Void

I.2.6 Void

I.2.7 Conditions for Measurements of the secondary component carrier with deactivated SCell

This section defines the SCH_RP and SCH Ês/Iot for measurements in the secondary component carrier applicable for a corresponding operating band

The conditions for measurements of the secondary component carrier with deactivated SCell are defined in Table I.2.7-1.

Table I.2.7-1: Measurements of the secondary component carrier with deactivated SCell

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-127	≥ -6
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.8 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction

This section defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements under time domain measurement resource restriction are defined in Table I.2.8-1.

Table I.2.8-1 E-UTRAN intra-frequency measurements under time domain measurement resource restriction

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	FDD_A, TDD_A	-127	≥ -7.5
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.9 Conditions for E-UTRAN Intra-Frequency Measurements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency SCH_RP and SCH Ês/Iot applicable for a corresponding operating band.

The conditions for intra-frequency E-UTRAN measurements under time domain measurement resource restriction with CRS assistance information are defined in Table I.2.9-1.

Table I.2.9-1: E-UTRAN intra-frequency measurements under time domain measurement resource restriction with CRS assistance information

Parameter	E-UTRA operating band groups Note 3	Minimum SCH_RP Note 1 dBm/15kHz	SCH Ês/Iot dB
Conditions	FDD_A, TDD_A	-127	≥ -11.07
	FDD_B	-126.5	
	FDD_C, TDD_C	-126	
	FDD_D	-125.5	
	FDD_E, TDD_E	-125	
	FDD_F	-124.5 Note 2	
	FDD_G	-124	
	FDD_H	-123.5	
	FDD_N	-120.5	

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.10 Conditions for E-UTRAN intra-frequency discovery signal measurements

This clause defines the E-UTRAN intra-frequency SCH_RP, SCH Ês/Iot in discovery signal occasions [9], applicable for a corresponding operating band for discovery signal measurements

The conditions for E-UTRAN intra-frequency discovery signal measurements are as in Table I.2.1-1.

I.2.11 Conditions for E-UTRAN inter-frequency discovery signal measurements

I.2.11.1 Conditions for E-UTRAN inter-frequency CRS-based measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, RSRP, and Ês/Iot in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table I.2.11.1-1.

Table I.2.11.1-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1	Minimum SCH_RP Note 1	RSRP Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-125	-125	≥ -6	≥ -6
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
	FDD_E, TDD_E	-123	-123		
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.11.2 Conditions for E-UTRAN inter-frequency CSI-RS based measurements

This clause defines the E-UTRAN inter-frequency SCH_RP, SCH Ês/Iot, CSI-RSRP, and CSI-RS Ês/Iot in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for E-UTRAN inter-frequency CRS-based discovery signal measurements in discovery signal occasions are specified in Table I.2.11.2-1.

Table I.2.11.2-1: E-UTRAN inter-frequency discovery signal measurements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP Note 1	Minimum SCH_RP Note 1	CSI-RS Ês/Iot	SCH Ês/Iot
		dBm/15kHz	dBm/15kHz	dB	dB
Conditions	FDD_A, TDD_A	-125	-125	≥ 0	≥ -6
	FDD_B	-124.5	-124.5		
	FDD_C, TDD_C	-124	-124		
	FDD_D	-123.5	-123.5		
	FDD_E, TDD_E	-123	-123		
	FDD_F	-122.5 Note 2	-122.5 Note 2		
	FDD_G	-122	-122		
	FDD_H	-121.5	-121.5		
	FDD_N	-118.5	-118.5		

NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2: The condition is -123 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.

I.2.12 to I.2.14

I.2.15 Conditions for NB-IoT intra-frequency measurements by UE Category NB1

This clause defines the NB-IoT intra-frequency NSCH_RP and NSCH Ês/Iot applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.2.15 is defined in Section 3.6.

The conditions for intra-frequency measurements in normal coverage are defined in Table I.2.15-1.

The conditions for intra-frequency measurements in denhanced coverage are defined in Table I.2.15-2.

Table I.2.15-1: NB-IoT intra-frequency measurements for HD-FDD in normal coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NSCH_RP	NSCH Ês/Iot
		dBm/15kHz	dB
Conditions	NFDD_G	-124	≥ -6
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.			

Table I.2.15-2: NB-IoT intra-frequency measurements for HD-FDD in enhanced coverage

Parameter	E-UTRA operating band groups Note 1	Minimum NSCH_RP	SCH Ês/Iot
		dBm/15kHz	dB
Conditions	NFDD_G	-124	≥ -15
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.			

I.3 Conditions for measurements performance requirements for UE

I.3.1 Conditions for intra-frequency RSRP and RSRQ Accuracy Requirements

This section defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements are defined in Table I.3.1-1.

Table I.3.1-1: Intra-frequency absolute RSRP and RSRQ Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.2 Void

I.3.3 Conditions for inter-frequency RSRP and RSRQ Accuracy Requirements

This section defines the E-UTRAN inter-frequency RSRP applicable for a corresponding operating band.

The conditions for inter-frequency absolute RSRP and RSRQ accuracy requirements are defined in Table I.3.1-1.

I.3.4 Conditions for inter-frequency relative RSRP and RSRQ Accuracy Requirements

This section defines the E-UTRAN inter-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for inter-frequency relative RSRP and RSRQ accuracy requirements are defined in Table I.3.8-1.

I.3.5 to I.3.7 Void

I.3.8 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements

This section defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements are specified in Table I.3.8-1.

Table I.3.8-1 Intra-frequency relative RSRP accuracy requirements

Parameter	E-UTRA operating band groups Note 3	Minimum RSRP1,2 Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3. NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz. NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.9 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction

This section defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements under time domain measurement resource restriction are as specified in Table I.3.1-1.

I.3.10 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction

This section defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements under time domain measurement resource restriction are defined in Table I.3.8-1.

I.3.11 Conditions for Intra-Frequency Absolute RSRP and RSRQ Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency RSRP applicable for a corresponding operating band.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements under time domain measurement resource restriction with CRS assistance information are as specified in Table I.3.1-1.

I.3.12 Conditions for Intra-Frequency Relative RSRP Accuracy Requirements under Time Domain Measurement Resource Restriction with CRS Assistance Information

This clause defines the E-UTRAN intra-frequency RSRP1,2 applicable for a corresponding operating band.

The conditions for intra-frequency relative RSRP accuracy requirements under time domain measurement resource restriction with CRS assistance information are as specified in Table I.3.8-1.

I.3.13 Void

I.3.14 Conditions for Intra-Frequency Absolute Discovery Signal Measurement Accuracy Requirements

I.3.14.1 Conditions for Intra-frequency CRS-based measurements

This clause defines the intra-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for intra-frequency absolute RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.1-1

I.3.14.2 Conditions for Intra-frequency CSI-RS-based measurements

This clause defines the intra-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for intra-frequency absolute CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are specified in Table I.3.14.2-1

Table I.3.14.2-1: Intra-frequency Absolute CSI-RSRP Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5

NOTE 1:	This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.
NOTE 2:	The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.
NOTE 3:	E-UTRA operating band groups are as defined in Section 3.5.

I.3.15 Conditions for Intra-Frequency Relative Discovery Signal Measurement Accuracy Requirements

I.3.15.1 Conditions for Intra-frequency CRS-based measurements

This clause defines the intra-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for intra-frequency relative RSRP accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.8-1.

I.3.15.2 Conditions for Intra-frequency CSI-RS-based measurements

This clause defines the intra-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for intra-frequency relative CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are specified in Table I.3.15.2-1.

Table I.3.15.2-1: Intra-frequency Relative CSI-RSRP Accuracy Requirements

Parameter	E-UTRA operating band groups Note 3	Minimum CSI-RSRP1,2 Note 1
		dBm/15kHz
Conditions	FDD_A, TDD_A	-127
	FDD_B	-126.5
	FDD_C, TDD_C	-126
	FDD_D	-125.5
	FDD_E, TDD_E	-125
	FDD_F	-124.5 Note 2
	FDD_G	-124
	FDD_H	-123.5
	FDD_N	-120.5
NOTE 1: This condition level is increased by Δ>0, when applicable, as described in Sections I.4.2 and I.4.3.		
NOTE 2: The condition is -125 dBm/15kHz when the carrier frequency of the assigned E-UTRA channel bandwidth is within 865-894 MHz.		
NOTE 3: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.16 Conditions for Inter-Frequency Absolute Discovery Signal Measurement Accuracy Requirements

I.3.16.1 Conditions for Inter-frequency CRS-based measurements

This clause defines the inter-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for inter-frequency absolute RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.1-1.

I.3.16.2 Conditions for Inter-frequency CSI-RS-based measurements

This clause defines the inter-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for inter-frequency absolute CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are as in Table I.3.14.2-1.

I.3.17 Conditions for Inter-Frequency Relative Discovery Signal Measurement Accuracy Requirements

I.3.17.1 Conditions for Inter-frequency CRS-based measurements

This clause defines the inter-frequency RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CRS based discovery signal measurements.

The conditions for inter-frequency relative RSRP and RSRQ accuracy requirements for CRS-based discovery signal measurements in discovery signal occasions are as in Table I.3.8-1.

I.3.17.2 Conditions for Inter-frequency CSI-RS-based measurements

This clause defines the inter-frequency CSI-RSRP in discovery signal occasions [9], applicable for a corresponding operating band for CSI-RS based discovery signal measurements.

The conditions for inter-frequency relative CSI-RSRP accuracy requirements for CSI-RS-based discovery signal measurements in discovery signal occasions are as in Table I.3.15.2-1.

I.3.18 to I.3.24

I.3.25 Conditions for NB-IoT intra-frequency Absolute NRSRP and NRSRQ Accuracy Requirements for UE Category NB1

This clause defines the NB-IoT intra-frequency NRSRP applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.3.25 is defined in Section 3.6.

The conditions for intra-frequency absolute NRSRP and NRSRQ accuracy requirements are defined in Table I.3.25-1.

Table I.3.25-1: NB-IoT intra-frequency absolute NRSRP and NRSRQ Accuracy Requirements

Parameter	E-UTRA operating band groups Note 1	Minimum NRSRP
		dBm/15kHz
Conditions	NFDD_G	-124
NOTE 1: E-UTRA operating band groups are as defined in Section 3.5.		

I.3.26 Conditions for NB-IoT inter-frequency Absolute NRSRP and NRSRQ Accuracy Requirements for UE Category NB1

This clause defines the NB-IoT inter-frequency NRSRP applicable for a corresponding operating band. The UE category NB1 applicability of the conditions in Appendix I.3.26 is defined in Section 3.6.

The conditions for inter-frequency absolute NRSRP and NRSRQ accuracy requirements are defined in Table I.3.25-1.

I.4 RRM Requirements Exceptions

I.4.1 General

I.4.2 Receiver sensitivity relaxation for UE supporting CA

For a UE supporting inter-band carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity $\Delta R_{IB,c}$>0 dB as defined in TS 36.101 [2], Table 7.3.1-1A, the relevant side conditions specifying received power levels (E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) shall be increased by the amount $\Delta = \Delta R_{IB,c}$ defined for each of the downlink E-UTRA bands.

NOTE: This side condition adjustment applies only for a UE supporting a single inter-band LTE CA band combination. For a UE supporting additional inter-band LTE CA band combinations, the $\Delta R_{IB,c}$ for all bands supported by the UE, need to be studied TS 36.101 [2].

I.4.3 Receiver sensitivity relaxation for UE configured with CA

I.4.3.1 Inter-band carrier aggregation

In this section, requirements exceptions are described for the UE configured with inter-band carrier aggregation with one uplink active in low operating band.

A relevant side condition (e.g., E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) in a requirement shall be increased by the amount Δ=L2-L1, where L1 is the reference sensitivity level specified in TS 36.101[2], Table 7.3.1-1, and L2 is the reference sensitivity level specified in TS 36.101[2], Table 7.3.1A-0a, when the following conditions are fulfilled,

- both downlink component carriers on different bands are configured with CA and active,
- the single uplink is active in the low operating band,
- the exception requirements specified in TS 36.101[2], Table 7.3.1A-0a, apply.

If the relaxation Δ specified in this section applies, then the relaxation specified in Section I.4.2 should not be applied.

I.4.3.2 Intra-band non-contiguous carrier aggregation

For a UE configured with intra-band non-contiguous carrier aggregation configuration with uplink in one E-UTRA band, if there is a relaxation of receiver sensitivity ΔR_{IBNC}>0 as defined in TS 36.101 [2], Table 7.3.1A-3, the relevant side conditions specifying received power levels (E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) shall be increased by the amount $\Delta = \Delta R_{IBNC}$ defined for the downlink SCC, when the following conditions are fulfilled,

- both downlink component carriers are configured with CA and active,
- one uplink carrier is active,
- the exception requirements specified in TS36.101[2], Table 7.3.1A-3, apply.

If the relaxation Δ specified in this section applies, then the relaxation specified in Section I.4.2 should not be applied.

I.4.3.3 Inter-band carrier aggregation with operating bands without uplink band

In this section, requirements are described for the UE configured with inter-band carrier aggregation involving one operating band without uplink band.

There is no relaxation in relevant side condition (e.g., E-UTRA RSRP, SCH_RP, PRP, CSI-RSRP, and Io) in a requirement, i.e., Δ=0, when the following conditions are fulfilled,

- both downlink component carriers on different bands are configured with CA and active,
- the single uplink is active in the high operating band,
- conditions specified in TS36.101[2], Table 7.3.1A-0d, apply.

If Δ specified in this section applies, then no other additional relaxation to REFSENS shall be applied.

Annex J (informative): Handling requirements and tests for different releases and UE capabilities

This annex gives guidance on how minimum requirements in different releases of 3GPP TS 36.133 [4] and different UE capabilities are handled in the specification 3GPP TS 36.521-3.

J.1 General considerations

Same as TS 36.521-1 [10] Annex I with the following exceptions:

- Instead of "*TS 36.101*" → use "*TS 36.133*"

- Instead of "*TS 36.521-1*" → use "*TS 36.521-3*"

- Instead of "*Annex I*" → use "*Annex J*"

J.2 Concrete scenarios

J.2.1 Tests for minimum requirements varying between releases, without introduction of new features

Same as TS 36.521-1 [10] Annex I with the following exceptions:

- Instead of "*TS 36.101*" → use "*TS 36.133*"

- Instead of "*TS 36.521-1*" → use "*TS 36.521-3*"

- Instead of "*Annex I*" → use "*Annex J*"

J.2.2 Tests for CA (Carrier aggregation)

FFS

Annex K (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2008-06	RAN5#39bis	R5-082129			R5-082129: Restructure of TS 36.521-1 and RRM proposal (Split of RRM from 36.521-1 v0.2.0 in its own specification 36.521-3 v0.1.0)		0.1.0
2008-06	*RAN5#39bis*	*R5-082174*			Following approved TPs have been included: R5-082129: Restructure of TS 36.521-1 and RRM proposal (Split of RRM from 36.521-1 v0.2.0 in its own specification 36.521-3 v0.1.0) R5-082160: Cover for LTE E-UTRAN RRC_IDLE State Mobility text proposal R5-082161: Cover for LTE E-UTRAN RRC_CONNECTED State Mobility text proposal R5-082162: Update of 36.521-1: Introduction of HRPD and CDMA2000 in RRM test cases R5-082163: Cover for LTE UE Transmit Timing Requirements text proposal Editorial changes for Annexes	*0.1.0*	*0.2.0*
2008-08	RAN5#40	R5-083164			Following approved TPs have been included: R5-083051: LTE E-UTRAN RRC_IDLE State Mobility text proposal R5-083052: LTE E-UTRAN RRC_CONNECTED State Mobility text proposal R5-083053: LTE UE Transmit Timing Requirements text proposal R5-083054: LTE UE Measurement Procedures text proposal R5-083813: LTE UE Measurement Performance Requirements text proposal R5-083138: Text proposal for LTE E-UTRAN Cell Re-selection to HRPD or to cdma2000 1xRTT in TS 36.521-3 R5-083056: RRC Connection Mobility Control text proposal R5-083164: LTE-RF 36-521-3 after RAN5#40 Editorial restructuring to section 4	0.2.0	0.3.0
2008-10	RAN5#40Bis	R5-084073			Following approved TPs have been included: R5-084073: TS 36.521-3 after RAN5#40Bis R5-084079: LTE Cell Re-Selection text proposal R5-084322: LTE FDD/FDD Handover for intra/inter frequency text proposal	0.3.0	0.4.0
2008-11	RAN5#41	R5-085084			Following approved TPs have been included: R5-085084 LTE-RF: TS 36.521-3 after RAN5#41 R5-085718 LTE RRM Cell Re-Selection text proposal R5-085719 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-085720 E-UTRAN FDD intra-frequency measurements text proposal R5-085740 RSRQ Accuracy Measurement Performance Requirements text proposal R5-085722 Text Proposal for Cell Configuration mapping annex in 36.521-3 Editor’s cleanup	0.4.0	0.5.0

2009-01	RAN5#41Bis	R5-086067			Following approved TPs have been included: R5-086067 LTE-RF: TS 36.521-3 after RAN5#41Bis R5-086149 References to connection diagrams R5-086418 LTE RRM Cell Re-Selection text proposal R5-086095 Cell configuration reference correction for RRM tests in 36.521-3 section 3A.3 R5-086419 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-086420 E-UTRAN FDD intra-frequency measurements text proposal R5-086431 RSRQ Accuracy Measurement Performance Requirements text proposal R5-086082 LTE UE Transmit Timing Requirements text proposal R5-086422 Text proposal for RSRP measurement accuracy test cases R5-086432 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-086142 Measurement Reference Channels and OCNG for RRM testing R5-086150 Statistical testing in RRM tests Editor's cleanup	0.5.0	0.6.0

2009-03	RAN5#42	R5-090191			Following approved TPs have been included: R5-091026 TDD Intra frequency RSRQ Accuracy R5-091085 TDD Inter frequency RSRQ Accuracy R5-091035 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-091047 E-UTRAN FDD intra-frequency measurements text proposal R5-091029 RSTQ Accuracy Measurement Performance Requirements text proposal R5-091041 LTE RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-091040 LTE RRM E-UTRA FDD to GSM Handover text proposal R5-090182 LTE UE Measurement Procedures Structure text proposal R5-091048 LTE RRM E-UTRA FDD to UTRA FDD Cell Search text proposal R5-090184 LTE UE inter-RAT Handover Structure text proposal R5-091039 LTE RRM E-UTRA FDD to UTRA FDD Handover text proposal R5-091053 LTE UE Transmit Timing Requirements text proposal R5-090191 LTE-RF: TS 36.521-3 after RAN5#42 R5-091091 Intra-frequency cell search TDD R5-091088 Intra-frequency Absolute RSRP measurement accuracy TDD R5-091090 Intra-frequency Relative RSRP measurement accuracy TDD R5-091089 Inter-frequency RSRP absolute accuracy TDD R5-091087 Inter-frequency RSRP relative accuracy TDD R5-091028 Text Proposal for RSRP Measurement Accuracy test cases R5-091076 Text Proposal for Annex C of TS 36.521-3 R5-091051 TP of E-UTRAN TDD & GSM cell re-selection test case R5-091043 TP of E-UTRAN TDD & TDD inter frequency cell re-selection test case R5-091036 TP of E-UTRAN TDD & TDD inter frequency handover test case R5-091044 TP of E-UTRAN TDD - TDD intra frequency cell re-selection test case R5-091038 TP of E-UTRAN TDD & TDD intra frequency handover test case R5-091045 TP of E-UTRAN TDD & UTRAN TDD cell re-selection test case R5-091049 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-091050 E-UTRAN TDD- TDD Inter-Frequency Measurements text proposal R5-091052 LTE-RF: Update to 36.521-3 Annex E Cell Configuration mapping R5-091064 Correction to frequencies to be tested in RRM test cases R5-091042 LTE RRM Cell Re-Selection text proposal Editor's cleanup	0.6.0	1.0.0

2009-03	RAN5#42Bis				R5-091263 LTE-RRM Cell Re-Selection text proposal R5-091922 LTE-RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-091923 LTE-RRM E-UTRA FDD - UTRA TDD Cell Re-Selection text proposal R5-091924 TP of E-UTRA TDD - GSM cell reselection R5-091945 TP of E-UTRA TDD-UTRAN TDD cell re-selection : UTRA is of higher priority R5-091926 TP of E-UTRA TDD - UTRA TDD cell reselection: UTRA is of lower priority test case R5-091264 LTE-RRM FDD/FDD Handover for intra/inter frequency text proposal R5-091931 LTE-RRM E-UTRA FDD to GSM Handover text proposal R5-091928 LTE-RRM E-UTRA FDD to UTRA FDD Handover text proposal R5-091946 LTE-RRM: E-UTRA TDD to UTRA FDD Handover text proposal R5-091947 LTE-RRM: Handover test proposal R5-091930 TP of E-UTRA TDD to UTRA TDD handover test case R5-091265 LTE-RRM E-UTRAN FDD intra-frequency measurements text proposal R5-091266 LTE-RRM RSRQ Accuracy Measurement Performance Requirements text proposal R5-091932 LTE-RRM E-UTRA FDD to UTRA FDD Cell Search (fading) text proposal R5-091933 LTE-RRM E-UTRAN FDD & UE Transmit Timing Accuracy text proposal R5-091276 LTE-RRM E-UTRAN FDD & UE Timing Advance Adjustment Accuracy text proposal R5-091934 LTE-RRM: E-UTRA TDD to UTRA FDD Cell Search (fading) text proposal R5-091935 LTE-RRM E-UTRAN TDD & UE Transmit Timing Accuracy text proposal R5-091936 LTE-RRM E-UTRAN TDD & UE Timing Advance Adjustment Accuracy text proposal R5-091937 LTE-RRM E-UTRA FDD to UTRA TDD Cell Search (fading) text proposal R5-091381 EUTRAN TDD to UTRAN TDD cell search (fading) R5-091386 LTE RRM TDD Inter Frequency RSRP Accuracy text proposal R5-091398 Text Proposal for RSRP Measurement Accuracy test cases R5-091948 LTE-RRM: Measurements test proposal R5-091431 RRM-EUTRAN FDD RLM test for out-of-sync R5-091434 RRM-EUTRAN TDD RLM test for out-of-sync R5-091435 RRM-EUTRAN FDD RLM test for In-sync R5-091436 RRM-EUTRAN TDD RLM test for In-sync R5-091468 RRM E-UTRAN FDD-FDD Inter-frequency Measurements R5-091469 RRM E-UTRAN TDD-TDD Inter-frequency Measurements R5-091939 LTE-RRM cell configuration mapping updates R5-091407 Update of statistical requirements to 36.521-3 Editor's cleanup	1.0.0	1.1.0

2009-05	RAN5#43	R5-092156			R5-092156 LTE-RF: TS 36.521-3 after RAN5#43 R5-092066 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-092617 RRM E-UTRAN TDD-TDD Inter-frequency Measurement R5-092068 RRM-EUTRAN FDD RLM test for out-of-sync and in-synch R5-092069 RRM-EUTRAN TDD RLM test for out-of-sync and in-synch R5-092071 Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas R5-092127 Update of statistical requirements to 36.521-3 R5-092630 LTE RRM: 1→2 RX antenna R5-092618 Text Proposal for E-UTRAN FDD-UTRAN FDD cell re-selection test cases R5-092651 Text Proposal for E-UTRAN FDD - GSM Measurements test case R5-092620 LTE-RRM E-UTRA TDD to GSM event triggered reporting in AWGN text proposal R5-092360 LTE RRM TDD Inter Frequency RSRP Accuracy text proposal R5-092621 LTE-RRM Default Message Contents for support of RRM text proposal R5-092384 LTE-RRM Update of Message Contents for E-UTRAN FDD RRM tests to align with support of RRM text proposal R5-092622 LTE-RRM E-UTRAN FDD Cell Re-Selection text proposal R5-092386 LTE-RRM FDD Inter Frequency RSRQ Accuracy Measurement Performance Requirements text proposal R5-092387 LTE-RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-092623 LTE-RRM E-UTRAN FDD intra frequency cell search (fading) in long DRX text proposal R5-092624 LTE-RRM E-UTRAN FDD intra frequency cell search (fading) in short DRX text proposal R5-092390 LTE-RRM E-UTRAN FDD - UE Transmit Timing Accuracy text proposal R5-092626 LTE-RRM E-UTRAN FDD random access: contention based scenario text proposal R5-092627 LTE-RRM E-UTRAN FDD random access: non-contention based scenario text proposal R5-092628 LTE-RRM E-UTRA FDD to HRPD Handover text proposal R5-092629 LTE-RRM E-UTRA FDD to cdma2000 1xRTT Handover text proposal R5-092443 Addition of band 18 and 19 to LTE RRM test cases Editor's cleanup	1.1.0	2.0.0
2009-05	RAN#44	-	-		Updated to v8.0.0 after RAN#44 with no technical change.	2.0.0	8.0.0
2009-06	-	-	-		Editorial clean up	8.0.0	8.0.1
2009-09	RAN#45	R5-094036	0001	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN (FDD) cell re-selection tests	8.0.1	8.1.0
2009-09	RAN#45	R5-094037	0002	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - FDD Inter Frequency Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094038	0003	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - FDD Intra Frequency Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094039	0004	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UE transmit timing accuracy test	8.0.1	8.1.0
2009-09	RAN#45	R5-094040	0005	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM cell re-selection test	8.0.1	8.1.0
2009-09	RAN#45	R5-094041	0006	-	Correction CR to 36.521-3: Update of Requirements conditions for E-UTRAN FDD - UE timing advance adjustment accuracy test	8.0.1	8.1.0
2009-09	RAN#45	R5-094042	0007	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094043	0008	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094045	0009	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094047	0010	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - Contention Based Random Access test	8.0.1	8.1.0
2009-09	RAN#45	R5-094048	0011	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - Non-Contention Based Random Access test	8.0.1	8.1.0

2009-09	RAN#45	R5-094049	0012	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD-FDD Inter-frequency cell search when DRX is used under fading propagation conditions	8.0.1	8.1.0
2009-09	RAN#45	R5-094050	0013	-	Correction CR to 36.521-3: Update of E-UTRAN FDD-FDD Intra-frequency cell search when DRX is used under fading propagation conditions	8.0.1	8.1.0
2009-09	RAN#45	R5-094051	0014	-	Correction CR to 36.521-3: Update of Annex H Default Message Contents for support of RRM	8.0.1	8.1.0
2009-09	RAN#45	R5-094217	0015	-	Update for E-UTRA FDD - UTRA TDD cell reselection	8.0.1	8.1.0
2009-09	RAN#45	R5-094218	0016	-	Test proposal for E-UTRA FDD - UTRA TDD HO	8.0.1	8.1.0
2009-09	RAN#45	R5-094219	0017	-	Test proposal for E-UTRA TDD random access: contention based scenario	8.0.1	8.1.0
2009-09	RAN#45	R5-094220	0018	-	Test proposal for E-UTRA TDD random access: non-contention based scenario	8.0.1	8.1.0
2009-09	RAN#45	R5-094221	0019	-	Update for TDD Intra-frequency RSRQ measurement accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094222	0020	-	Update for TDD Inter-frequency RSRQ measurement accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094223	0021	-	Update for E-UTRAN TDD Transmit timing accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094225	0022	-	Update for E-UTRA FDD - UTRA TDD cell search(fading)	8.0.1	8.1.0
2009-09	RAN#45	R5-094253	0023	-	CR to 36.521-3: Addition of E-UTRAN FDD Intra-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094254	0024	-	CR to 36.521-3: Addition of E-UTRAN FDD Inter-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094285	0025	-	LTE-RRM: Introduction of Common Exception messages table for E-UTRAN TDD-UTRAN FDD handover and E-UTRAN TDD-UTRAN FDD measurements	8.0.1	8.1.0
2009-09	RAN#45	R5-094358	0026	-	Correction to RSRP measurement accuracy test cases	8.0.1	8.1.0
2009-09	RAN#45	R5-094442	0027	-	CR to 36.521-3: Update of E-UTRA FDD to HRPD Handover and E-UTRA FDD to cdma2000 1xRTT Handover test cases	8.0.1	8.1.0
2009-09	RAN#45	R5-094709	0028	-	LTE RRM: Correction to test cases 4.4.1 and 4.4.2	8.0.1	8.1.0
2009-09	RAN#45	R5-094713	0029	-	Resubmission - Update to E-UTRAN to HRPD Cell Re-Selection (HRPD is of lower priority) test case	8.0.1	8.1.0
2009-09	RAN#45	R5-094720	0030	-	Resubmission - Update to E-UTRAN to CDMA2000 1xRTT Cell Re-Selection (CDMA2000 1xRTT is of lower priority) test case	8.0.1	8.1.0
2009-09	RAN#45	R5-094743	0031	-	RRM TCs in test mode	8.0.1	8.1.0
2009-09	RAN#45	R5-094927	0032	-	Correction CR to 36.521-3: Update of inter-frequency E-UTRAN TDD-TDD cell re-selection 4.2.6	8.0.1	8.1.0
2009-09	RAN#45	R5-094928	0033	-	Correction CR to 36.521-3: Update of E-UTRAN TDD - UTRAN TDD cell re-selection 4.3.4	8.0.1	8.1.0
2009-09	RAN#45	R5-094929	0034	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD cell re-selection test	8.0.1	8.1.0
2009-09	RAN#45	R5-094930	0035	-	LTE-RRM: Addition of common messages to Annex H	8.0.1	8.1.0
2009-09	RAN#45	R5-094931	0036	-	Test Proposal for E-UTRAN TDD Intra-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094932	0037	-	Test Proposal for E-UTRAN TDD Inter-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094933	0038	-	Update for E-UTRAN TDD Timing advanced adjustment accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094934	0039	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094935	0040	-	E-UTRA TDD - TDD Intra frequency cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094936	0041	-	TDD - TDD RSRP measurement	8.0.1	8.1.0
2009-09	RAN#45	R5-094937	0042	-	Update 8.10.1 E-UTRAN TDD-GSM event triggered reporting in AWGN	8.0.1	8.1.0
2009-09	RAN#45	R5-094938	0043	-	Add new tc 8.10.2 EUTRAN TDD-GSM cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094939	0044	-	Add new tc 8.7.2 EUTRAN TDD - UTRAN TDD cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094940	0045	-	E-UTRA TDD - TDD Inter frequency cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094942	0046	-	Update to Annex E Cell Configuration Mapping	8.0.1	8.1.0
2009-09	RAN#45	R5-094967	0047	-	RRM Radio Link Monitoring FDD update	8.0.1	8.1.0
2009-09	RAN#45	R5-094968	0048	-	RRM Radio Link Monitoring TDD update	8.0.1	8.1.0
2009-09	RAN#45	R5-094969	0050	-	RRM: E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting	8.0.1	8.1.0
2009-09	RAN#45	R5-094970	0051	-	CR to 36.521-3:Message updates for RSRP and RSRQ Accuracy measurement	8.0.1	8.1.0
2009-09	RAN#45	R5-094971	0052	-	RRM OCNG and RMC update	8.0.1	8.1.0
2009-09	RAN#45	R5-094972	0053	-	RRM: Update of Annex E for SON	8.0.1	8.1.0
2009-12	RAN#46	R5-095492	0054	-	Removal of test state 4 in RRM test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-095493	0055	-	CR to 36.521-3 Annexes of E-UTRAN cell reselection test cases	8.1.0	8.2.0

2009-12	RAN#46	R5-095499	0056	-	CR for E-UTRAN FDD - UTRAN TDD handover	8.1.0	8.2.0
2009-12	RAN#46	R5-095501	0057	-	CR for E-UTRAN TDD - UE Transmit Timing Accuracy	8.1.0	8.2.0
2009-12	RAN#46	R5-095503	0058	-	CR for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095504	0059	-	Correction to TDD RSRP and RSRQ measurement requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-095527	0060	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD cell re-selection intra frequency case and inter frequency case conformance minimum requirements updates	8.1.0	8.2.0
2009-12	RAN#46	R5-095528	0061	-	Correction CR to 36.521-3: E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of higher priority and UTRA FDD is of lower priority conformance minimum requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-095529	0062	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency event triggered reporting under fading propagation conditions in asynchronous cells case	8.1.0	8.2.0
2009-12	RAN#46	R5-095530	0063	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency event triggered reporting when DRX is used under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095531	0064	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Intra Frequency event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095537	0065	-	Correction CR to 36.521-3: E-UTRAN FDD - UE Transmit Timing Accuracy case	8.1.0	8.2.0
2009-12	RAN#46	R5-095538	0066	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD inter frequency event triggered reporting when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-095557	0067	-	Correction CR to 36.521-3: General RRM Updates	8.1.0	8.2.0
2009-12	RAN#46	R5-095572	0068	-	Update TC 8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095573	0069	-	Update TC 8.10.2 E-UTRAN TDD - GSM event triggered reporting when DRX is used in AWGN	8.1.0	8.2.0
2009-12	RAN#46	R5-095576	0070	-	Update TC 8.2.1 E-UTRAN TDD - TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	8.1.0	8.2.0
2009-12	RAN#46	R5-095591	0071	-	update of Annex H.2.3 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-095741	0072	-	CR to the inconsistent expression in UE Measurements Procedures	8.1.0	8.2.0
2009-12	RAN#46	R5-095917	0073	-	Update: Radio Link Monitoring test cases: no DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096145	0074	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency Absolute RSRP Accuracy case	8.1.0	8.2.0
2009-12	RAN#46	R5-096243	0075	-	Update to RRM TC:E-UTRAN FDD - UTRAN TDD cell re-selection	8.1.0	8.2.0
2009-12	RAN#46	R5-096244	0104	1	Addition of new TC to 36.521-3: E-UTRAN TDD - UTRAN FDD cell re-selection test	8.1.0	8.2.0
2009-12	RAN#46	R5-096246	0105	-	Modification of section 4.2.2 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-096247	0106	-	Modification of section 4.2.2 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-096255	0076	-	CR to the RA response window's name in Random Access conformance requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-096257	0077	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority	8.1.0	8.2.0
2009-12	RAN#46	R5-096258	0078	1	Addition of new TC to 36.521-3:E-UTRAN TDD - GSM Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096263	0079	1	Add new TC 5.1.6 E-UTRAN TDD - TDD inter frequency handover: unknown target cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096265	0080	-	CR to 36.521-3: Update of E-UTRA FDD to HRPD Handover and E-UTRA FDD to cdma2000 1xRTT Handover test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-096267	0081	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - GSM Cell Search when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096268	0082	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD Cell Search when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096269	0083	-	RRM: Update of test case 8.4.1 TDD inter-frequency event triggered reporting	8.1.0	8.2.0
2009-12	RAN#46	R5-096271	0084	-	LTE-RF: Update to Annex E Cell Configuration Mapping	8.1.0	8.2.0
2009-12	RAN#46	R5-096272	0085	-	Correction CR to 36.521-3: Addition of message contents exceptions for E-UTRAN inter frequency and inter-RAT Cell Search for when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096273	0086	-	Correction CR to 36.521-3: E-UTRAN FDD - UTRA FDD Handover case	8.1.0	8.2.0
2009-12	RAN#46	R5-096274	0087	-	CR to 36.521-3: Update to FDD Intra-frequency RRC Re-establishment test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096275	0088	-	CR to 36.521-3: Update to FDD Inter-frequency RRC Re-establishment test case	8.1.0	8.2.0

2009-12	RAN#46	R5-096276	0107	-	Test Case of E-UTRAN TDD to GSM Handover	8.1.0	8.2.0
2009-12	RAN#46	R5-096296	0089	-	Update TC 8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-096302	0090	-	Correction CR to 36.521-3: E-UTRAN FDD - GSM event triggered reporting in AWGN case	8.1.0	8.2.0
2009-12	RAN#46	R5-096303	0091	-	Addition of new TC to 36.521-3: E-UTRAN TDD to E-UTRAN TDD and UTRA TDD cell search test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096310	0092	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096324	0093	-	Addition of new TC to 36.521-3 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096325	0094	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - FDD inter frequency Handover test cases: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096326	0095	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - GSM Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096327	0096	-	Addition of new TC to 36.521-3: E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096328	0097	-	E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096329	0098	-	E-UTRAN FDD Radio Link Monitoring test for in-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096330	0099	-	E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096331	0100	-	E-UTRAN TDD Radio Link Monitoring test for in-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096332	0101	-	RRM: Update of test case 8.3.1 FDD inter-frequency event triggered reporting	8.1.0	8.2.0
2009-12	RAN#46	R5-096337	0102	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Handover intra frequency and inter frequency case	8.1.0	8.2.0
2009-12	RAN#46	R5-096340	0103	-	Introduction of uncertainties for RRM test cases 4.2.1 and 4.2.2	8.1.0	8.2.0
2010-03	RAN#47	R5-100130	0108	-	Test Tolerances and alignment with 36.133 for cell re-selection intra frequency cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100132	0109	-	Uncertainties and Test Tolerances for inter frequency cell re-selection	8.2.0	8.3.0
2010-03	RAN#47	R5-100135	0110	-	Clarification of Extreme conditions for RSRP test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100362	0113	-	CR about the Cell Search Requirements for LTE FDD-FDD/ TDD-TDD Handover to Unknown Target Cell	8.2.0	8.3.0
2010-03	RAN#47	R5-100365	0114	-	CR on updating the handover delay requirements for E-UTRAN TDD - TDD both intra-frequency and inter-frequency handovers	8.2.0	8.3.0
2010-03	RAN#47	R5-100367	0115	-	CR to correct the test requirements of reselection from E-UTRAN FDD/TDD to UTRAN TDD	8.2.0	8.3.0
2010-03	RAN#47	R5-100394	0116	-	Correction of Annex H about measurement performance messages	8.2.0	8.3.0
2010-03	RAN#47	R5-100401	0117	-	RRM Inter frequency cell search updates, TC 8.3.1 and 8.4.1	8.2.0	8.3.0
2010-03	RAN#47	R5-100438	0118	-	Update TC 8.7.1, 8.9.1 and 8.11.4	8.2.0	8.3.0
2010-03	RAN#47	R5-100460	0119	-	Misc update on 521-3	8.2.0	8.3.0
2010-03	RAN#47	R5-100486	0120	-	CR to 36.521-3: Addition of E-UTRA FDD to HRPD Handover: Unknown Target Cell and E-UTRA FDD to cdma2000 1xRTT Handover: Unknown Target Cell test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100519	0121	-	Correction to RSRP Accuracy test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100546	0122	-	CR to 36.521-3: Update to E-UTRAN FDD RRC Re-establishment test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100562	0123	-	CR to 36.521-3: Update LTE RRM test cases with test requirements for extended LTE1500	8.2.0	8.3.0
2010-03	RAN#47	R5-100714	0124	-	Addition of missing Es/Noc parameters in RRM test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100715	0125	-	Correction to GSM measurement configuration in Annex H.3.1	8.2.0	8.3.0
2010-03	RAN#47	R5-100716	0126	-	Update on Annex C for 36.521-3	8.2.0	8.3.0
2010-03	RAN#47	R5-100849	0127	-	Text on exclusion of extra delay due to RRC retransmission	8.2.0	8.3.0
2010-03	RAN#47	R5-100850	0128	-	Correction to test iteration procedure in cell re-selection TCs	8.2.0	8.3.0
2010-03	RAN#47	R5-100852	0129	-	DL Mac Padding for RRM TCs	8.2.0	8.3.0
2010-03	RAN#47	R5-100853	0130	-	Update TC 5.1.6 E-UTRAN TDD-TDD inter frequency handover unknown target cell	8.2.0	8.3.0
2010-03	RAN#47	R5-100854	0131	-	New RRM test case, 8.7.3 E-UTRAN TDD SON ANR	8.2.0	8.3.0

2010-03	RAN#47	R5-100859	0132	-	Update TC 8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	8.2.0	8.3.0
2010-03	RAN#47	R5-100860	0133	-	Update TC 8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100861	0134	-	Update TC 8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100862	0135	-	Misc update on test applicability	8.2.0	8.3.0
2010-03	RAN#47	R5-100865	0136	-	CR about corrections of PDSCH Reference Measurement Channels	8.2.0	8.3.0
2010-03	RAN#47	R5-100866	0137	-	CR about OFDMA Channel Noise Generator (OCNG)	8.2.0	8.3.0
2010-03	RAN#47	R5-100873	0138	-	CR to 36.521-3 Rel-8 Introduction of E-UTRAN FDD - FDD Intra Frequency Cell Search with DRX when L3 filtering is used	8.2.0	8.3.0
2010-03	RAN#47	R5-100890	0139	-	Update to RRM TC: TDD Intra frequency RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100896	0140	-	Clarification on Time offset between cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100897	0141	-	Update to RRM TC:E-UTRAN TDD-TDD cell re-selection	8.2.0	8.3.0
2010-03	RAN#47	R5-100898	0142	-	Update to RRM TC: TDD Inter frequency RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100900	0143	-	Uncertainties and Test Tolerances for FDD Intra Frequency Absolute RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100901	0144	-	RRM TTIdcch and cell timing change, update of chapter 8	8.2.0	8.3.0
2010-03	RAN#47	-	-	-	Moved to v9.0.0 with no change	8.3.0	9.0.0
2010-06	RAN#48	R5-103105	0145	-	CR to 36.521-3: Update RSRP test cases with band 11 and 21	9.0.0	9.1.0
2010-06	RAN#48	R5-103116	0146	-	Correction of CR conflict for Intra Frequency TDD reselection test	9.0.0	9.1.0
2010-06	RAN#48	R5-103117	0147	-	Reference to TR 36.903 in TS 36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103312	0149	-	Connection diagram for test 8.11.2 (3 cells)	9.0.0	9.1.0
2010-06	RAN#48	R5-103315	0150	-	Correction to connection diagram reference for test 8.10.1 and 8.10.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103330	0151	-	update on test applicability	9.0.0	9.1.0
2010-06	RAN#48	R5-103358	0152	-	Annex E update	9.0.0	9.1.0
2010-06	RAN#48	R5-103496	0153	-	LTE-RRM: Update of test procedure for measurement performance test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103526	0154	-	CR 36.521-3 on corrections to requirements in Idle Mode	9.0.0	9.1.0
2010-06	RAN#48	R5-103528	0155	-	CR 36.521-3 on correction to InterRAT handover minimum requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103531	0156	-	CR 36.521-3 on correction to measurement requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103532	0157	-	CR 36.521-3 on correction to E-UTRA inter frequency cell search requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103534	0158	-	CR 36.521-3 on correction to UE transmit timing minimum and test requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103541	0159	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD HO inter-frequency case	9.0.0	9.1.0
2010-06	RAN#48	R5-103546	0160	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD intra frequency cell search under fading in asynchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103547	0161	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD intra frequency cell search under fading in synchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103548	0162	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD-TDD intra frequency cell search under fading in synchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103607	0163	-	Correction to step of physical cell identity change in 4.2.3	9.0.0	9.1.0
2010-06	RAN#48	R5-103608	0164	-	Correction of test mode reference to 36.508	9.0.0	9.1.0
2010-06	RAN#48	R5-103611	0165	-	Correction to the references of exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103612	0166	-	Correction to b2-Threshold1 in the exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103613	0194	-	Correction to Radio Resource Configuration in UE transmit timing and UE timing advance TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103614	0195	-	Correction to Gap Pattern Id in the exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103615	0196	-	Correction to Measure object and ID in the exceptional messages	9.0.0	9.1.0
2010-06	RAN#48	R5-103658	0197	-	Iteration in cell reselection tests	9.0.0	9.1.0
2010-06	RAN#48	R5-103709	0167	-	Connection diagram reference for intra-freq measurement TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103724	0168	-	LTE-RRM:CR to E-UTRAN TDD RRC Re-establishment test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103734	0169	-	Test Tolerances and alignment for RLM FDD TC 7.3.1, 7.3.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103736	0170	-	Uncertainties and Test Tolerances for Inter Frequency Absolute RSRP Accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103737	0171	-	Uncertainties and Test Tolerances for TC 8.1.3 and 8.2.2	9.0.0	9.1.0

2010-06	RAN#48	R5-103738	0172	-	Uncertainties and Test Tolerances for TC 8.4.1 and 8.4.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103739	0173	-	LTE-RRM: CR for Test Tolerances of intra-freq hand over test cases (5.1.1 & 5.1.2)	9.0.0	9.1.0
2010-06	RAN#48	R5-103740	0174	-	LTE-RRM:CR for Test Tolerances of inter-freq absolute RSRQ accuracy test cases (9.2.3.1 & 9.2.4.1)	9.0.0	9.1.0
2010-06	RAN#48	R5-103741	0175	-	LTE-RRM:CR for Test Tolerances of inter-freq relative RSRQ accuracy test cases (9.2.3.2 & 9.2.4.2)	9.0.0	9.1.0
2010-06	RAN#48	R5-103742	0176	-	Uncertainties and Test Tolerances for Inter Frequency Relative RSRP Accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103743	0177	-	LTE-RRM: CR on Test Tolerances for TDD intra-freq absolute RSRP accuracy Test	9.0.0	9.1.0
2010-06	RAN#48	R5-103744	0178	-	LTE-RRM: CR on Test Tolerances for TDD intra-freq relative RSRP accuracy Test case	9.0.0	9.1.0
2010-06	RAN#48	R5-103745	0179	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD-TDD HO inter-frequency case	9.0.0	9.1.0
2010-06	RAN#48	R5-103746	0180	-	Additions to measurement uncertainties and Test Tolerances for E-UTRAN FDD-FDD and TDD-TDD HO inter-frequency case in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103747	0181	-	Additions to measurement uncertainties and Test Tolerances for E-UTRAN FDD-FDD and TDD-TDD intra frequency cell search in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103748	0182	-	Addition of test tolerances and system uncertainties for FDD intra frequency absolute RSRQ accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103749	0183	-	Addition of test tolerances and system uncertainties for TDD intra frequency absolute RSRQ accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103750	0184	-	Additions to measurement uncertainties and Test Tolerances for FDD and TDD intra frequency absolute RSRQ accuracy in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103758	0185	-	CR on 36.521-3 for corrections of missing Es/Noc parameters in RRM test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103759	0186	-	Adding new test case 8.11.5 Combined E-UTRAN - EUTRAN FDD and GSM cell search	9.0.0	9.1.0
2010-06	RAN#48	R5-103760	0187	-	Adding new test case 8.11.6 Combined E-UTRAN - EUTRAN TDD and GSM cell search.	9.0.0	9.1.0
2010-06	RAN#48	R5-103761	0188	-	Adding test case 8.7.3, 8.11.5, 8.11.6 to Annex E Cell configuration mapping.	9.0.0	9.1.0
2010-06	RAN#48	R5-103769	0189	-	Adding band 20, 800MHz in EU to TS36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103773	0190	-	Iteration in Handover and Re-establishment test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103779	0191	-	LTE-RRM: Addition of new TC E-UTRAN FDD -UTRAN FDD CPICH Ec/No absolute accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103783	0192	-	Correction to q-RxLevMin for E-UTRAN - GSM cell re-selection	9.0.0	9.1.0
2010-06	RAN#48	R5-103784	0145	-	DL Mac Padding for RRM TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103105	0146	-	CR to 36.521-3: Update RSRP test cases with band 11 and 21	9.0.0	9.1.0
2010-06	RAN#48	R5-103116	0147	-	Correction of CR conflict for Intra Frequency TDD reselection test	9.0.0	9.1.0
2010-06	RAN#48	R5-103117	0201	-	Reference to FTR 36.903 in TS 36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103312	0150	-	Connection diagram for test 8.11.2 (3 cells)	9.0.0	9.1.0
2010-06	RAN#48	R5-103315	0151	-	Correction to connection diagram reference for test 8.10.1 and 8.10.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103330	0152	-	update on test applicability	9.0.0	9.1.0
2010-06	RAN#48	R5-103358	0153	-	Annex E update	9.0.0	9.1.0
2010-09	RAN#49	R5-104098	0198	-	PUSCH Scheduling for RRM tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104103	0199	-	Delay exclusion for retransmissions in RRM test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104108	0200	-	Expiry of contention resolution timer in Contention based PRACH test	9.1.0	9.2.0
2010-09	RAN#49	R5-104160	0201	-	Uncertainties and Test Tolerances for FDD Intra Frequency Relative RSRP Accuracy section 9.1.1.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104230	0202	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD cell re-selection intra frequency case 4.2.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104231	0203	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD cell re-selection inter frequency case 4.2.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104232	0204	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD Handover intra frequency case 5.1.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104233	0205	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD Handover inter frequency case 5.1.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104247	0206	-	Addition of Cell Configuration Mapping for Cell Search Test	9.1.0	9.2.0
2010-09	RAN#49	R5-104248	0207	-	CR to 36.521-3 on Correction to cell search	9.1.0	9.2.0
2010-09	RAN#49	R5-104249	0208	-	CR to 36.521-3 on Correction to UE Measurement Procedures	9.1.0	9.2.0
2010-09	RAN#49	R5-104250	0209	-	CR to 36.521-3 on Correction to RRM Cell Search	9.1.0	9.2.0
2010-09	RAN#49	R5-104251	0210	-	CR to 36.521-3 on Correction to RRM General	9.1.0	9.2.0

2010-09	RAN#49	R5-104260	0211	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD random access tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104261	0212	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD random access tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104262	0213	-	LTE-RRM: Addition of new TC E-UTRAN TDD -UTRAN FDD CPICH Ec/No absolute accuracy	9.1.0	9.2.0
2010-09	RAN#49	R5-104263	0214	-	LTE-RRM: Addition of new TC E-UTRAN TDD -UTRAN FDD CPICH RSCP absolute accuracy	9.1.0	9.2.0
2010-09	RAN#49	R5-104451	0215	-	Test Tolerances and alignment for RLM FDD TC 7.3.3, 7.3.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104452	0216	-	Test Tolerances and alignment for RLM FDD TC 7.3.5, 7.3.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104453	0217	-	Test Tolerances and alignment for RLM TDD TC 7.3.7, 7.3.8	9.1.0	9.2.0
2010-09	RAN#49	R5-104456	0218	-	Uncertainties and Test Tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment	9.1.0	9.2.0
2010-09	RAN#49	R5-104460	0219	-	Uncertainties and Test Tolerances for E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	9.1.0	9.2.0
2010-09	RAN#49	R5-104497	0220	-	Clarification on the neighbour cell info	9.1.0	9.2.0
2010-09	RAN#49	R5-104498	0221	-	Addition of the exceptional message to UE Transmit Timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104499	0222	-	Maintenance on exceptional messages for annex info	9.1.0	9.2.0
2010-09	RAN#49	R5-104500	0223	-	Correction to 6.1.1 and 6.1.2 of RRC Re-establishment test case	9.1.0	9.2.0
2010-09	RAN#49	R5-104501	0224	-	Maintenance on exceptional messages for Mobility Control Info	9.1.0	9.2.0
2010-09	RAN#49	R5-104521	0225	-	36521-3 General update of sections 00 to 07: missing Introduction references formatting	9.1.0	9.2.0
2010-09	RAN#49	R5-104563	0226	-	Update on exclusion of extra delay due to RRC retransmission	9.1.0	9.2.0
2010-09	RAN#49	R5-104616	0227	-	36.521-3 Correction to test procedure in 8.11.5 and 8.11.6 test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104625	0228	-	E-UTRAN TDD inter-frequency reselection test	9.1.0	9.2.0
2010-09	RAN#49	R5-104650	0229	-	Clarifications of test requirements in measurement accuracy tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104663	0230	-	36.521-3: Annex B and Annex C update	9.1.0	9.2.0
2010-09	RAN#49	R5-104825	0231	-	Missing cell Identity change step for test cases with unknown cell 2 timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104826	0232	-	Addition of test tolerances and system uncertainties for FDD timing characteristics tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104827	0233	-	Addition of test tolerances and system uncertainties for TDD timing characteristics tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104828	0234	-	Additions to measurement uncertainties and test tolerances for timing characteristics tests in annex F	9.1.0	9.2.0
2010-09	RAN#49	R5-104829	0235	-	Uncertainties and Test Tolerances for E-UTRAN FDD Inter-frequency RRC Re-establishment	9.1.0	9.2.0
2010-09	RAN#49	R5-104830	0236	-	Uncertainties and Test Tolerances for E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	9.1.0	9.2.0
2010-09	RAN#49	R5-104839	0237	-	36521-3: Editorial update of sections 08	9.1.0	9.2.0
2010-09	RAN#49	R5-104849	0238	-	Maintenance on the exceptional messages in Ch8 - Annex	9.1.0	9.2.0
2010-09	RAN#49	R5-104855	0239	-	Uncertainties, Test Tolerances and Test Requirements for UE Transmit Timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104856	0240	-	GSM carrier RSSI measurement accuracy in E-UTRAN TDD	9.1.0	9.2.0
2010-09	RAN#49	R5-104859	0241	-	E-UTRAN_to_UTRAN_FDD_reselection	9.1.0	9.2.0
2010-09	RAN#49	R5-104864	0242	-	Applicability of RRM inter-frequency test cases to (narrow) frequency bands	9.1.0	9.2.0
2010-09	RAN#49	R5-104865	0243	-	Maintenance on the exceptional messages in Ch5 - Ch6	9.1.0	9.2.0
2010-09	RAN#49	R5-104866	0244	-	36.521-3: Annex E update	9.1.0	9.2.0
2010-09	RAN#49	R5-104880	0245	-	Correction to E-UTRAN to UTRAN Cell Re-Selection test case	9.1.0	9.2.0
2010-09	RAN#49	R5-104881	0246	-	Redundant information in RRM Random Access Test Requirements	9.1.0	9.2.0
2010-09	RAN#49	R5-104883	0247	-	E-UTRAN TDD to UTRAN FDD Handover	9.1.0	9.2.0
2010-09	RAN#49	R5-104885	0248	-	Cell ID change time and iteration procedure for RRM test cases 4.2.1, 4.2.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104886	0249	-	Cell ID change time for RRM test cases 4.2.3, 4.2.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104887	0250	-	Scrambling code change time for RRM test cases 4.3.1.1, 4.3.4.1, 8.5.2, 8.7.3, 8.11.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104889	0251	-	Iteration procedure for handover and re-establishment test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104890	0252	-	Correction to cell re-selection inter frequency test case	9.1.0	9.2.0

2010-09	RAN#49	R5-105057	0253	-	Clarification of Radio link monitoring test cases	9.1.0	9.2.0
2010-09	RAN#49	RP-100941	0254	-	Correction of status for RRM test cases and missing information in Annex	9.1.0	9.2.0
-	-	-	-	-	Re-insertion of the ambiguous step 11 of cl. 5.2.2.4.2 according to R5-104825 after email discussion	9.2.0	9.2.1
2010-12	RAN#50	R5-106079	0255	-	HARQ delay exclusion for HO test: Clarification for UE-DTX-case	9.2.1	9.3.0
2010-12	RAN#50	R5-106080	0256	-	Iteration procedure for inter RAT handover test cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106082	0257	-	Corrections to event triggered measurement tests using DRX (Clause 8)	9.2.1	9.3.0
2010-12	RAN#50	R5-106083	0258	-	Missing titles in the RRM specification	9.2.1	9.3.0
2010-12	RAN#50	R5-106085	0259	-	Scheduling of System information for RRM tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106086	0260	-	Update of PDCCH aggregation level for channel BW 1,4 MHz	9.2.1	9.3.0
2010-12	RAN#50	R5-106119	0261	-	CR to 36.521-3: Update LTE RRM test requirements for EUTRA TDD LTE band 41.	9.2.1	9.3.0
2010-12	RAN#50	R5-106313	0262	-	Uncertainties and Test Tolerances for Connected State Mobility test	9.2.1	9.3.0
2010-12	RAN#50	R5-106314	0263	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Test in Annex	9.2.1	9.3.0
2010-12	RAN#50	R5-106318	0264	-	Correction to inter-RAT Connected State Mobility test setup	9.2.1	9.3.0
2010-12	RAN#50	R5-106320	0265	-	Correction to Inter-RAT Connected State Mobility test requirements	9.2.1	9.3.0
2010-12	RAN#50	R5-106321	0266	-	Correction to Inter-RAT Connected State Mobility for Alignment	9.2.1	9.3.0
2010-12	RAN#50	R5-106322	0267	-	Correction to Inter-RAT Connected State Mobility test requirements	9.2.1	9.3.0
2010-12	RAN#50	R5-106448	0268	-	Addition of SIB7 exceptional messages	9.2.1	9.3.0
2010-12	RAN#50	R5-106451	0269	-	Correction to UE transmit timing TC	9.2.1	9.3.0
2010-12	RAN#50	R5-106455	0270	-	Correction to the exceptional messages in RSRQ tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106456	0271	-	Correction to Min Test time for RRM fading tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106483	0272	-	Annex E update	9.2.1	9.3.0
2010-12	RAN#50	R5-106493	0273	-	CR to 36.521-3: Update to G.2.6 Test Conditions for Delay Tests and UE Measurement Performance	9.2.1	9.3.0
2010-12	RAN#50	R5-106805	0274	-	Correction to test case 5.1.2 - Update of E-UTRAN TDD-TDD Handover intra frequency case	9.2.1	9.3.0
2010-12	RAN#50	R5-106806	0275	-	Correction to test case 5.1.4 - Update of E-UTRAN TDD-TDD Handover inter frequency case	9.2.1	9.3.0
2010-12	RAN#50	R5-106807	0276	-	Correction to Inter-RAT UE Measurements Procedures	9.2.1	9.3.0
2010-12	RAN#50	R5-106808	0277	-	Correction to Inter-RAT UE Measurements Procedures under fading	9.2.1	9.3.0
2010-12	RAN#50	R5-106810	0278	-	Correction to test case 8.2.1	9.2.1	9.3.0
2010-12	RAN#50	R5-106811	0279	-	Correction to test case 8.2.2	9.2.1	9.3.0
2010-12	RAN#50	R5-106812	0295	-	Update of RRM OCNG patterns	9.2.1	9.3.0
2010-12	RAN#50	R5-106829	0280	-	General Corrections to RRC_IDLE State Mobility	9.2.1	9.3.0
2010-12	RAN#50	R5-106830	0281	-	Correction to test case 6.2.3	9.2.1	9.3.0
2010-12	RAN#50	R5-106831	0282	-	Correction to test case 6.2.4	9.2.1	9.3.0
2010-12	RAN#50	R5-106832	0283	-	Correction to MeasConfig-DEFAULT in RRM TCs	9.2.1	9.3.0
2010-12	RAN#50	R5-106833	0284	-	Adding support of inter-band test configuration for RRM inter-frequency/inter-RAT test cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106834	0285	-	CR on UEs RRM Band applicability	9.2.1	9.3.0
2010-12	RAN#50	R5-106835	0286	-	Correction to test case 7.1.2	9.2.1	9.3.0
2010-12	RAN#50	R5-106836	0287	-	Correction to test case 10.1.2.1, 9.1.2.2 and 9.2.2.1	9.2.1	9.3.0
2010-12	RAN#50	R5-106840	0288	-	Update to Radio Link Monitoring Test Cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106857	0291	-	Correction to DL configuration on Non-Contention Based Random Access Test	9.2.1	9.3.0
2010-12	RAN#50	R5-106859	0292	-	Corrections to UE transmit timing tests (Subclause 7.3)	9.2.1	9.3.0
2010-12	RAN#50	R5-106862	0293	-	Correction to DL configuration on Contention Based Random Access Test	9.2.1	9.3.0
2010-12	RAN#50	R5-106864	0294	-	Update of Annex G for RLM test in DRX	9.2.1	9.3.0
2010-12	RAN#50	R5-106870	0289	-	Uncertainties and Test Tolerances for UE measurements procedures test	9.2.1	9.3.0
2010-12	RAN#50	R5-106871	0290	-	Addition to Measurement Uncertainties and Test Tolerances for UE Measurement Procedures test in Annex	9.2.1	9.3.0
2011-03	RAN#51	R5-110150	0296	-	RRC Re-establishment tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110151	0297	-	Radio link monitoring tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110155	0298	-	UE Measurements Procedures tests: Test loop	9.3.0	9.4.0
2011-03	RAN#51	R5-110167	0299	-	Removal of [ ] from PDSCH and PCFICH/PDCCH/PHICH Measurement Channel references	9.3.0	9.4.0
2011-03	RAN#51	R5-110348	0300	-	Revision of 36.521-3 Annex G - Statistical testing	9.3.0	9.4.0

2011-03	RAN#51	R5-110418	0301	-	Correction to TDD cell re-selection	9.3.0	9.4.0
2011-03	RAN#51	R5-110419	0302	-	Correction to exception messages in 4.5.1 HRPD Re selection test	9.3.0	9.4.0
2011-03	RAN#51	R5-110424	0303	-	Alignment of exception messages for TDD event triggered measurement tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110435	0304	-	Modification of message content definition for TC 8.4.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110437	0305	-	Update to TC 8.6.1: E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110438	0306	-	Correction to TC 8.7.1: E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110443	0307	-	Update to TC 8.8.1: E-UTRAN FDD - GSM event triggered reporting in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110445	0308	-	Corrections to TC 8.9.1: E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110520	0309	-	Correction to Inter-RAT Connected State Mobility for Alignment	9.3.0	9.4.0
2011-03	RAN#51	R5-110546	0310	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to UTRAN test	9.3.0	9.4.0
2011-03	RAN#51	R5-110549	0312	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM unknown test	9.3.0	9.4.0
2011-03	RAN#51	R5-110584	0314	-	Correction to gap pattern ID in test case 5.1.4	9.3.0	9.4.0
2011-03	RAN#51	R5-110586	0315	-	Clarification to 1.4 MHz testing and applicability in test case 7.1.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110588	0316	-	Test time limit correction for DRX=40ms in test case 8.1.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110863	0330	-	Higher SNR on event triggered measurement tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110866	0311	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to UTRAN test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110868	0313	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM unknown test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110902	0317	-	CR to 36.521-3: Update LTE RRM test requirements for EUTRA TDD LTE band 41	9.3.0	9.4.0
2011-03	RAN#51	R5-110903	0318	-	Correction to exception messages in 5.3.1 HRPD HHO test	9.3.0	9.4.0
2011-03	RAN#51	R5-110904	0319	-	MIMO Correlation scenario for RLM test cases	9.3.0	9.4.0
2011-03	RAN#51	R5-110905	0320	-	Enabling HARQ for section 8 and 9 RRM Tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110907	0321	-	Re-ordering of Time periods, definition of uncertainties, and addition of Test Tolerances for RRM test case 4.3.1.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110910	0322	-	Updated Test Tolerances for RRM Test cases 7.1.1 + 7.1.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110911	0323	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110912	0324	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110927	0325	-	Corrections to RRM TC 8.1.1, 8.1.2 and 8.1.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110928	0326	-	Corrections to test cases about E-UTRAN FDD-FDD Inter-frequency measurement 8.3.1, 8.3.2 and 8.3.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110929	0327	-	Corrections to TCs related to E-UTRAN FDD - UTRAN measurements: 8.5.1, 8.5.2 and 8.5.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110930	0328	-	UE Measurement procedures tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110931	0329	-	DL-RMC-s and OCNG for RRM tests: Updates	9.3.0	9.4.0
2011-03	RAN#51	R5-110946	0331	-	Uncertainties and Test Tolerances for RRM test case 4.3.1.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110948	0332	-	Uncertainties and Test Tolerances for RRM test cases 4.4.1 and 4.4.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110956	0333	-	Modification of test case 5.1.6 - E-UTRAN TDD-TDD inter frequency handover: unknown target cell	9.3.0	9.4.0
2011-03	RAN#51	R5-110957	0334	-	LTE RRM: reference to state 3A in 36.521-3	9.3.0	9.4.0
2011-03	RAN#51	R5-110958	0335	-	Correction to RRM testes for Alignment	9.3.0	9.4.0
2011-03	RAN#51	R5-110959	0336	-	CR to 36.521-3: E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110960	0337	-	CR to 36.521-3: Addition of Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110961	0338	-	CR to 36.521-3: E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110962	0339	-	Correction to exception messages in Radio Link Monitoring Test	9.3.0	9.4.0
2011-03	RAN#51	R5-110963	0340	-	Correction to TC 8.4.2: E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	9.3.0	9.4.0

2011-03	RAN#51	R5-110964	0341	-	Corrections to TC 8.7.3: E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110965	0342	-	Correct the message definitions related to the RSRP and RSRQ performance testing	9.3.0	9.4.0
2011-03	RAN#51	R5-110966	0343	-	Update of RRM test 8.5.2 FDD SON	9.3.0	9.4.0
2011-03	RAN#51	R5-110974	0344	-	PUSCH scheduling: Correction for considering DRX	9.3.0	9.4.0
2011-03	RAN#51	R5-110980	0345	-	Correction to TC 8.8.2: E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110981	0346	-	Update to TC 8.10.1: E-UTRAN TDD - GSM event triggered reporting in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110982	0347	-	Corrections to TC 8.10.2: E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110983	0348	-	Modification to TC 8.7.2: E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110995	0352	-	Radio link monitoring test 7.3.4: Minor correction to the test requirement	9.3.0	9.4.0
2011-03	RAN#51	R5-110996	0353	-	Radio link monitoring tests: Corrections to the test procedure	9.3.0	9.4.0
2011-06	RAN#52	R5-112124	0354	-	Uncertainties and Test Tolerances for RRM test case 8.7.1	9.4.0	9.5.0
2011-06	RAN#52	R5-112126	0355	-	Uncertainties and Test Tolerances for RRM test case 8.7.2	9.4.0	9.5.0
2011-06	RAN#52	R5-112128	0356	-	Uncertainties and Test Tolerances for RRM test cases 8.8.1+8.10.1	9.4.0	9.5.0
2011-06	RAN#52	R5-112152	0357	-	RRM TC-s 4.2: Transition between time intervals	9.4.0	9.5.0
2011-06	RAN#52	R5-112153	0358	-	RRM TC 4.2.6: Introduction of time duration T0	9.4.0	9.5.0
2011-06	RAN#52	R5-112155	0359	-	RRM TC-s clause 8: Reference to the state 3A / 3A-RF in the test loop	9.4.0	9.5.0
2011-06	RAN#52	R5-112185	0360	-	Addition of new RRM TC 4.3.4.3: EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority	9.4.0	9.5.0
2011-06	RAN#52	R5-112314	0365	-	Correction to E-UTRAN FDD - UTRAN FDD cell re-selection when UTRA FDD is under lower priority	9.4.0	9.5.0
2011-06	RAN#52	R5-112315	0366	-	Correction to E-UTRA FDD-high UTRA FDD inter RAT cell re-selection test case	9.4.0	9.5.0
2011-06	RAN#52	R5-112316	0367	-	Correction to E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions	9.4.0	9.5.0
2011-06	RAN#52	R5-112317	0368	-	Correction on test cases of E-UTRA to UTRA cell reselection in idle state	9.4.0	9.5.0
2011-06	RAN#52	R5-112318	0369	-	Correction to E-UTRAN TDD - UTRAN TDD test case in 36.521-3	9.4.0	9.5.0
2011-06	RAN#52	R5-112418	0370	-	Update of 4.3.1.3 E-UTRA-UTRA reselection test case	9.4.0	9.5.0
2011-06	RAN#52	R5-112421	0371	-	Correction to 6.1 RRC Re-establishment test case	9.4.0	9.5.0
2011-06	RAN#52	R5-112423	0372	-	Maintenance on Message contents in 8.5.3	9.4.0	9.5.0
2011-06	RAN#52	R5-112424	0373	-	Correction to Annex H.3.3 for Inter-RAT E-UTRAN - HRPD handover	9.4.0	9.5.0
2011-06	RAN#52	R5-112454	0374	-	Wrong references into statistical annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112457	0375	-	References into connection diagrams in 36.508,Annex A	9.4.0	9.5.0
2011-06	RAN#52	R5-112470	0376	-	Misalignment in Meas Gap configuration	9.4.0	9.5.0
2011-06	RAN#52	R5-112475	0377	-	Band 20 missing in section 9 test cases	9.4.0	9.5.0
2011-06	RAN#52	R5-112533	0378	-	Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM test	9.4.0	9.5.0
2011-06	RAN#52	R5-112536	0379	-	Addition to Measurement Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM test in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112543	0380	-	Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM unknown test	9.4.0	9.5.0
2011-06	RAN#52	R5-112544	0381	-	Addition to Measurement Uncertainties and Test Tolerances for connected state mobility Inter-RAT TDD to GSM unknown test in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112546	0382	-	Uncertainties and Test Tolerances for Inter-RAT to UTRAN event triggered reporting under fading test	9.4.0	9.5.0
2011-06	RAN#52	R5-112554	0383	-	Uncertainties and Test Tolerances for Inter-RAT to GSM event triggered when DRX is used in AWGN tests	9.4.0	9.5.0
2011-06	RAN#52	R5-112555	0384	-	Addition to Measurement Uncertainties and Test Tolerances for Inter-RAT to GSM event triggered when DRX is used in AWGN tests in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112734	0385	-	Addition of Band 24 to section 9.1 and 9.2 , RSRP and RSRQ measurement performance requirements	9.4.0	9.5.0
2011-06	RAN#52	R5-112741	0363	-	Uncertainties and Test Tolerances for RRM test case 10.3.1	9.4.0	9.5.0
2011-06	RAN#52	R5-112742	0364	-	Uncertainties and Test Tolerances for RRM test case 9.3.2	9.4.0	9.5.0
2011-06	RAN#52	R5-112745	0394	-	Completing for E-UTRAN TDD-UTRAN TDD cell reselection_UTRA is of lower priority	9.4.0	9.5.0

2011-06	RAN#52	R5-112746	0395	-	Completing for E-UTRAN FDD-UTRAN FDD-UTRAN TDD cell reselection	9.4.0	9.5.0
2011-06	RAN#52	R5-112803	0386	-	Addition to Measurement Uncertainties and Test Tolerances for Inter-RAT to UTRAN event triggered reporting under fading test in Annex	9.4.0	9.5.0
2011-06	RAN#52	R5-112815	0387	-	Correction to test frequency references in RRM initial condition	9.4.0	9.5.0
2011-06	RAN#52	R5-112817	0388	-	RRM TC-s 8.1.1, 8.1.2, 8.1.3, 8.2.1, 8.2.2: Changing SNR for serving cell	9.4.0	9.5.0
2011-06	RAN#52	R5-112818	0389	-	RRM TC 9.6.2: Overall corrections	9.4.0	9.5.0
2011-06	RAN#52	R5-112819	0390	-	CR for 9.4 UTRA FDD measurement accuracy	9.4.0	9.5.0
2011-06	RAN#52	R5-112820	0391	-	Add test frequencies for bands 42, 43 (3500MHz)	9.4.0	9.5.0
2011-06	RAN#52	R5-112849	0398	-	Update of clause 3A.3 RRM test configuration	9.4.0	9.5.0
2011-06	RAN#52	R5-112853	0399	-	Correction to inconsistent test procedures in RRM	9.4.0	9.5.0
2011-06	RAN#52	R5-112855	0400	-	Uncertainties and Test Tolerances for RRM test case 5.2.10	9.4.0	9.5.0
2011-06	RAN#52	R5-112858	0401	-	Addition of new RRM TC 8.4.3: E-UTRAN TDD-TDD inter-freq event triggered reporting under AWGN in synchronous cells with DRX when L3 filtering is used	9.4.0	9.5.0
2011-09	RAN#53	R5-113183	0402	-	RRM TC 8: Adding missing PRACH Configuration for some tests	9.5.0	9.6.0
2011-09	RAN#53	R5-113226	0403	-	Uncertainties and Test Tolerances for RRM test case 4.3.1.3	9.5.0	9.6.0
2011-09	RAN#53	R5-113249	0404	-	Uncertainties and Test Tolerances for TC 5.2.1	9.5.0	9.6.0
2011-09	RAN#53	R5-113250	0405	-	Uncertainties and Test Tolerances for TC 5.2.2	9.5.0	9.6.0
2011-09	RAN#53	R5-113395	0406	-	Not tested minimum requirement in Clause 8	9.5.0	9.6.0
2011-09	RAN#53	R5-113460	0407	-	Correction to 4.2.3	9.5.0	9.6.0
2011-09	RAN#53	R5-113461	0408	-	Correction to the exceptional messages in HO TCs with unknown target cell	9.5.0	9.6.0
2011-09	RAN#53	R5-113462	0409	-	Maintenance on the exceptional messages for Mobility Control Info	9.5.0	9.6.0
2011-09	RAN#53	R5-113463	0410	-	Correction to 6.2.3 and 6.2.4	9.5.0	9.6.0
2011-09	RAN#53	R5-113466	0411	-	Correction to FDD RSRP and RSRQ test	9.5.0	9.6.0
2011-09	RAN#53	R5-113467	0412	-	Correction to TDD RSRP and RSRQ test for band 41	9.5.0	9.6.0
2011-09	RAN#53	R5-113468	0413	-	Correction to the exceptional messages in Annex H	9.5.0	9.6.0
2011-09	RAN#53	R5-113597	0414	-	Abbreviation update and Editorial corrections in TS36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-113843	0443	-	Adding FGI Applicabilities into Chapters 4 - 7 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-113844	0440	-	RRM TCs 5.1: PRACH power configuration	9.5.0	9.6.0
2011-09	RAN#53	R5-113845	0444	-	RRM TCs 7.3: Update of the test procedure and requirements	9.5.0	9.6.0
2011-09	RAN#53	R5-113846	0425	-	Statistical clarification for TC 8.3.3 and 8.3.4	9.5.0	9.6.0
2011-09	RAN#53	R5-114005	0415	-	LTE-RRM: Corrections to test iteration for test case 4.3.4.1	9.5.0	9.6.0
2011-09	RAN#53	R5-114007	0416	-	Correction on the inter-RAT cell identification time in DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114009	0417	-	Completing for E-UTRAN TDD - UTRAN TDD handover test case	9.5.0	9.6.0
2011-09	RAN#53	R5-114013	0418	-	Uncertainties and Test Tolerance for FDD SON ANR test case 8.5.2	9.5.0	9.6.0
2011-09	RAN#53	R5-114016	0419	-	Uncertainties and Test Tolerances for TC 9.4.1 and 9.4.2	9.5.0	9.6.0
2011-09	RAN#53	R5-114019	0420	-	CR Uncertainties and TT for 8.4.3 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114021	0421	-	CR Uncertainties and TT for 4.3.4.3 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114026	0422	-	Deletion of editor note for discrepancy between TT and 36.903	9.5.0	9.6.0
2011-09	RAN#53	R5-114050	0423	-	RRM: Use of State 3A-RF	9.5.0	9.6.0
2011-09	RAN#53	R5-114055	0424	-	RRM TCs 7.2: Transition between iteration loops	9.5.0	9.6.0
2011-09	RAN#53	R5-114057	0426	-	Statistical clarification in 6 Test cases in clause 8.11.	9.5.0	9.6.0
2011-09	RAN#53	R5-114059	0427	-	Completing for E-UTRAN TDD-UTRAN TDD cell re-selection_UTRA is of higher priority	9.5.0	9.6.0
2011-09	RAN#53	R5-114060	0428	-	Uncertainties and Test Tolerances for TC 8.9.1	9.5.0	9.6.0
2011-09	RAN#53	R5-114072	0429	-	Update LTE RRM test requirements for FDD LTE Band 23 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114084	0430	-	Simplification of frequency dependent minimum requirements in TS36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114097	0431	-	Adding FGI Applicabilities into Chapters 8 - 9 in 36.521-3	9.5.0	9.6.0
2011-09	RAN#53	R5-114099	0432	-	Addition of new RRM TC 8.1.5´╝ÜE-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0
2011-09	RAN#53	R5-114100	0433	-	Addition of new RRM TC 8.1.6: E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114101	0434	-	Addition of new RRM TC 8.2.3: E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0

2011-09	RAN#53	R5-114102	0435	-	Addition of new RRM TC 8.2.4: E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114103	0436	-	Addition of new RRM TC 8.3.4´╝ÜE-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0
2011-09	RAN#53	R5-114104	0437	-	Addition of new RRM TC 8.3.5:E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114105	0438	-	Addition of new RRM TC 8.4.4:E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	9.5.0	9.6.0
2011-09	RAN#53	R5-114106	0439	-	Addition of new RRM TC 8.4.5:E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX	9.5.0	9.6.0
2011-09	RAN#53	R5-114111	0441	-	Correction to RLM	9.5.0	9.6.0
2011-09	RAN#53	R5-114115	0442	-	LTE-RRM: Correction to test procedure for inter-RAT cell reselection test cases	9.5.0	9.6.0
2011-09	RAN#53	R5-114119	0445	-	Introduction of Expanded 1900MHz Band (Band 25) into section 9 of 36.521-3	9.5.0	9.6.0
2011-12	RAN#54	R5-115121	0446	-	RRM TC-s 7, 8: Iteration loop and usage of the UE states 3A / 3A-RF	9.6.0	9.7.0
2011-12	RAN#54	R5-115140	0447	-	Modify the test requirement table in the TC 5.2.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115142	0449	-	LTE-RRM :Update to Annex E	9.6.0	9.7.0
2011-12	RAN#54	R5-115189	0452	-	Uncertainties and Test Tolerances for RRM test case 8.11.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115199	0453	-	Correction of references to Annex I in TS36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115200	0454	-	Test System uncertainties for frequencies between 3000MHz to 4200MHz in 36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115202	0456	-	Uncertainties and Test Tolerance for TDD SON ANR test case 8.7.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115327	0457	-	Correction to RRM tests 7.1.2 and 7.2.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115379	0458	-	Update of operating band configuration	9.6.0	9.7.0
2011-12	RAN#54	R5-115381	0459	-	Correction to FGI in test applicability for Cell reselection test case	9.6.0	9.7.0
2011-12	RAN#54	R5-115385	0460	-	Correction to 5.2.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115386	0461	-	Alignment of the exceptional messages in 7.3.x RLM	9.6.0	9.7.0
2011-12	RAN#54	R5-115387	0462	-	Correction to 8.10.1 and 8.10.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115388	0463	-	Correction to the exceptional message in 8.6.1.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115403	0465	-	Uncertainties and Test Tolerances for RRM test case 4.3.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115433	0466	-	Corrections to TC 5.1.5 and TC 5.1.6 inter-f HO: unknown target cell	9.6.0	9.7.0
2011-12	RAN#54	R5-115435	0467	-	Updates of TC 5.2.3: E-UTRAN FDD - GSM handover	9.6.0	9.7.0
2011-12	RAN#54	R5-115479	0468	-	Corrections to RSRQ in Intra-Frequency Measurement Minimum Requirements	9.6.0	9.7.0
2011-12	RAN#54	R5-115482	0469	-	Addition to measurement uncertainties and test tolerances E-UTRAN FDD - UTRAN FDD event triggered reporting w/DRX under fading test in Annex	9.6.0	9.7.0
2011-12	RAN#54	R5-115787	0471	-	Uncertainties and Test Tolerances for RRM test case 8.11.1 and 8.11.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115582	0472	-	RRM TC 6.2: Corrections to power settings	9.6.0	9.7.0
2011-12	RAN#54	R5-115814	0473	-	Incomplete test case for 7.1.1 and 7.1.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115823	0474	-	Uncertainties and TT for TC 6.1.3 and 6.1.4 in 36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115827	0477	-	Correction to Test Tolerances for RRM ch.9 test cases	9.6.0	9.7.0
2011-12	RAN#54	R5-115833	0478	-	Adding band 22 (3500MHz FDD) to 36.521-3	9.6.0	9.7.0
2011-12	RAN#54	R5-115834	0479	-	RRM: Phase rotation for intra frequency tests in static conditions	9.6.0	9.7.0
2011-12	RAN#54	R5-115835	0480	-	Addition of the exceptional message in 4.6.1.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115836	0481	-	Addition of undefined UTRA system information for TC 4.3.1.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115838	0482	-	Corrections to TC 5.2.1 and TC 5.2.2: E-UTRAN FDD/TDD - UTRAN FDD handover	9.6.0	9.7.0
2011-12	RAN#54	R5-115839	0483	-	Corrections to message content definition for TC 5.1.1 and TC 5.1.2: intra-f HO	9.6.0	9.7.0
2011-12	RAN#54	R5-115840	0484	-	Updates to TC 5.1.3 and TC 5.1.4: inter-f HO	9.6.0	9.7.0
2011-12	RAN#54	R5-115841	0485	-	Updates of TC 5.2.4 and TC 5.2.5: E-UTRAN FDD/TDD - UTRAN TDD handover	9.6.0	9.7.0
2011-12	RAN#54	R5-115842	0486	-	Removal of measurement related message definitions in TC 5.2.7, TC 5.2.9 and TC 5.2.10	9.6.0	9.7.0
2011-12	RAN#54	R5-115843	0487	-	Modification of message definitions in the Annex H	9.6.0	9.7.0
2011-12	RAN#54	R5-115844	0488	-	Modification of the test cases of Random Access	9.6.0	9.7.0
2011-12	RAN#54	R5-115845	0489	-	RRM TC-s 9: Missing bands in specification	9.6.0	9.7.0

2011-12	RAN#54	R5-115846	0490	-	RRM TC-s 7.3: SRS configuration in radio link monitoring tests	9.6.0	9.7.0
2011-12	RAN#54	R5-115847	0491	-	Correction to test frequency in MeasConfig-DEFAULT	9.6.0	9.7.0
2011-12	RAN#54	R5-115848	0492	-	Corrections to TC 7.1.1 and TC 7.1.2: UE Transmit Timing Accuracy	9.6.0	9.7.0
2011-12	RAN#54	R5-115850	0493	-	Correction to 5.2.6	9.6.0	9.7.0
2011-12	RAN#54	R5-115878	0494	-	Correction to cell reselection delay in test procedure	9.6.0	9.7.0
2011-12	RAN#54	R5-115882	0495	-	Addition of undefined UTRA system information for TC 4.3.1.2 and TC 4.3.1.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115883	0496	-	Addition of undefined UTRA system information for TC 4.3.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115884	0497	-	Addition of undefined UTRA system information for TC 4.3.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115885	0498	-	Addition of undefined UTRA system information for TC 4.3.4.1	9.6.0	9.7.0
2011-12	RAN#54	R5-115886	0499	-	Addition of UTRA system information definitions for TC 4.3.4.2	9.6.0	9.7.0
2011-12	RAN#54	R5-115887	0500	-	Updates of the message content definitions for TC 4.3.4.3	9.6.0	9.7.0
2011-12	RAN#54	R5-115888	0501	-	Updates of TC 4.4.1 and TC 4.4.2: E-UTRAN FDD/TDD - GSM cell re-selection	9.6.0	9.7.0
2011-12	RAN#54	R5-115786	0502	-	Corrections to test cases for E-UTRAN RRC Re-establishment	9.6.0	9.7.0
2011-12	RAN#54	R5-115893	0503	-	RRM TC-s 4: General review of the test procedures of cell re-selection test cases	9.6.0	9.7.0
2011-12	RAN#54	R5-115481	0504	-	Uncertainties and test tolerances E-UTRAN FDD - UTRAN FDD event triggered reporting w/DRX under fading test	9.6.0	9.7.0
2012-03	RAN#55	R5-120107	0505	-	Uncertainties and Test Tolerance for E-UTRAN TDD Intra-frequency new CGI test cases 8.2.3 and 8.2.4	9.7.0	9.8.0
2012-03	RAN#55	R5-120124	0506	-	Uncertainties and Test Tolerance for E-UTRAN TDD Inter-frequency new CGI test cases 8.4.4 and 8.4.5.	9.7.0	9.8.0
2012-03	RAN#55	R5-120141	0507	-	RRM: Iteration loop in cdma2000 reselection tests	9.7.0	9.8.0
2012-03	RAN#55	R5-120178	0508	-	RF/RRM: Correction on TC 8.4.1 message content definition	9.7.0	9.8.0
2012-03	RAN#55	R5-120183	0509	-	RF/RRM: Addition of new TC 4.2.4 E-UTRAN FDD - TDD cell re-selection inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120184	0510	-	RF/RRM: Addition of new TC 4.2.5 E-UTRAN TDD - FDD cell re-selection inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120185	0511	-	RF/RRM: Addition of new TC 5.1.7 E-UTRAN FDD - TDD handover inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120186	0512	-	RF/RRM: Addition of new TC 5.1.8 E-UTRAN TDD - FDD handover Inter frequency case	9.7.0	9.8.0
2012-03	RAN#55	R5-120187	0513	-	RF/RRM: Addition of new TC 8.12.1 E-UTRAN TDD - FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	9.7.0	9.8.0
2012-03	RAN#55	R5-120189	0514	-	RF/RRM: Addition of new TC 9.1.5.1 FDD - TDD Inter Frequency Absolute RSRP Accuracy	9.7.0	9.8.0
2012-03	RAN#55	R5-120190	0515	-	RF/RRM: Addition of new TC 9.1.5.2 FDD - TDD Inter Frequency Relative Accuracy of RSRP	9.7.0	9.8.0
2012-03	RAN#55	R5-120191	0516	-	RF/RRM: Addition of Cell configuration mapping for those new RRM test cases	9.7.0	9.8.0
2012-03	RAN#55	R5-120245	0517	-	Update of 36.521-3 Test Cases 9.1.4.1 and 9.1.4.2, Io difference band-independent	9.7.0	9.8.0
2012-03	RAN#55	R5-120249	0518	-	Uncertainties and Test Tolerances for RRM test case 8.11.4	9.7.0	9.8.0
2012-03	RAN#55	R5-120321	0519	-	Update of 4.3.1 E-UTRAN FDD - UTRAN FDD cell re-selection	9.7.0	9.8.0
2012-03	RAN#55	R5-120322	0520	-	Update of 4.3.4 E-UTRAN TDD - UTRAN TDD cell re-selection	9.7.0	9.8.0
2012-03	RAN#55	R5-120323	0521	-	Adding E-UTRAN test parameter reference to messages exception	9.7.0	9.8.0
2012-03	RAN#55	R5-120324	0522	-	Correction to 4.6.1.1 E-UTRAN FDD c2k cell re-selection	9.7.0	9.8.0
2012-03	RAN#55	R5-120325	0523	-	Correction to 5.2.4 E-UTRAN TDD - UTRAN TDD handover	9.7.0	9.8.0
2012-03	RAN#55	R5-120339	0524	-	Addition of FGI bit 16 into test cases 9.1.x.x and 9.2.x.x	9.7.0	9.8.0
2012-03	RAN#55	R5-120341	0525	-	Correction to FGI bits in test case 8.5.2	9.7.0	9.8.0
2012-03	RAN#55	R5-120424	0526	-	Correction to TIntra in Minimum Conformance Requirements	9.7.0	9.8.0
2012-03	RAN#55	R5-120425	0527	-	Correction to the identification time in DRX for UTRA TDD	9.7.0	9.8.0
2012-03	RAN#55	R5-120515	0528	-	Addition of FGI bit 15 into test cases configuring event 1B	9.7.0	9.8.0
2012-03	RAN#55	R5-120808	0535	-	RF/RRM: Corrections on RSRP and RSRQ accuracy related test cases	9.7.0	9.8.0
2012-03	RAN#55	R5-120809	0536	-	TS 36.521-3: 8.3.3 and 8.4.3 T2 value correction	9.7.0	9.8.0
2012-03	RAN#55	R5-120810	0537	-	TS 36.521-3: 6.2.3 Extreme conditions test tolerance correction	9.7.0	9.8.0

2012-03	RAN#55	R5-120827	0538	-	Correction to CQI report configuration of 7.1.1 in TS36.521-3	9.7.0	9.8.0
2012-03	RAN#55	R5-120846	0539	-	Test configuration for Inter RAT testcases, delete note	9.7.0	9.8.0
2012-03	RAN#55	R5-120847	0540	-	RF/RRM: Addition of new TC 8.13.1 E-UTRAN FDD - TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	9.7.0	9.8.0
2012-03	RAN#55	R5-120848	0541	-	Correction to 8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR	9.7.0	9.8.0
2012-03	RAN#55	R5-120892	0542	-	Update of PRACH test case	9.7.0	9.8.0
2012-03	RAN#55	R5-120894	0543	-	Correction to 5.2.10 E-UTRAN TDD - UTRAN TDD handover	9.7.0	9.8.0
2012-03	RAN#55	R5-120895	0544	-	Correction to test frequency in MeasConfig-DEFAULT for E-UTRAN to GSM cell search test case	9.7.0	9.8.0
2012-03	RAN#55	R5-120907	0547	-	Uncertainties and Test Tolerances for E-UTRAN to HRPD Cell reselection TC 4.5.1.1	9.7.0	9.8.0
2012-03	RAN#55	R5-120917	0546	-	Uncertainties and Test Tolerances for E-UTRAN to HRPD HO TC 5.3.1	9.7.0	9.8.0
2012-03	RAN#55	R5-120530	0529	-	Introduction to FDD RSRQ for E-UTRA Carrier Aggregation	9.8.0	10.0.0
2012-03	RAN#55	R5-120531	0530	-	Introduction to TDD RSRQ for E-UTRA Carrier Aggregation	9.8.0	10.0.0
2012-03	RAN#55	R5-120532	0531	-	Introduction to FDD RSRQ for E-UTRA Carrier Aggregation in Annex	9.8.0	10.0.0
2012-03	RAN#55	R5-120533	0532	-	Introduction to TDD RSRQ for E-UTRA Carrier Aggregation in Annex	9.8.0	10.0.0
2012-03	RAN#55	R5-120535	0533	-	Introduction to Carrier Aggregation in Radio Resource Management	9.8.0	10.0.0
2012-03	RAN#55	R5-120536	0534	-	Introduction to Carrier Aggregation in Default Message Contents	9.8.0	10.0.0
2012-06	RAN#56	R5-121229	0549	-	Correction of test procedures for Autonomous gap test cases, section 8	10.0.0	10.1.0
2012-06	RAN#56	R5-121240	0550	-	Revise test frequencies for FDD-TDD interworking Test cases	10.0.0	10.1.0
2012-06	RAN#56	R5-121247	0551	-	RRM: Removal of Editors note on connection diagram used in intra frequency tests in static conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-121527	0552	-	Addition of Handover to UTRAN commands in 36.521-3	10.0.0	10.1.0
2012-06	RAN#56	R5-121528	0553	-	Correction of drx-RetransmissionTimer parameters	10.0.0	10.1.0
2012-06	RAN#56	R5-121529	0554	-	Correction to Test2 in 7.1.1 and 7.1.2 of 36.521-3	10.0.0	10.1.0
2012-06	RAN#56	R5-121530	0555	-	Correction to DRX offset in 7.1.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121532	0557	-	Correction to 8.11.1 and 8.11.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121547	0558	-	Addition of new TCs for UTRAN TDD P-CCPCH RSCP measurement	10.0.0	10.1.0
2012-06	RAN#56	R5-121691	0559	-	TS 36.521-3: 8.3.3 and 8.4.3 update	10.0.0	10.1.0
2012-06	RAN#56	R5-121901	0560	-	Introduction of E-UTRAN Inter Introduction of E-UTRAN Inter frequency case reselection in the existence of non-allowed CSG cell	10.0.0	10.1.0
2012-06	RAN#56	R5-121902	0561	-	Addition of new RRM TC 6.3.1: Redirection from E-UTRAN FDD to UTRAN FDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121922	0562	-	Addition of new RRM TC 6.3.2: Redirection from E-UTRAN TDD to UTRAN FDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121923	0563	-	Addition of new RRM TC 6.3.3: Redirection from E-UTRAN FDD to GERAN when System Information is provided	10.0.0	10.1.0
2012-06	RAN#56	R5-121924	0564	-	Addition of new RRM TC 6.3.4: Redirection from E-UTRAN TDD to GERAN when System Information is provided	10.0.0	10.1.0
2012-06	RAN#56	R5-121927	0565	-	Uncertainties and Test Tolerances for TC 9.6.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121929	0566	-	Uncertainties and Test Tolerances for RRM test cases 4.2.4 and 4.2.5	10.0.0	10.1.0
2012-06	RAN#56	R5-121930	0567	-	Uncertainties and Test Tolerances for RRM test cases 5.1.7 and 5.1.8	10.0.0	10.1.0
2012-06	RAN#56	R5-121931	0568	-	Uncertainties and Test Tolerances for RRM test cases 8.14.1	10.0.0	10.1.0
2012-06	RAN#56	R5-121932	0569	-	Uncertainties and Test Tolerances for RRM test case 8.15.1	10.0.0	10.1.0
2012-06	RAN#56	R5-121933	0570	-	Uncertainties and Test Tolerances for RRM test case 9.1.5.1	10.0.0	10.1.0
2012-06	RAN#56	R5-121934	0571	-	Uncertainties and Test Tolerances for FDD - TDD Inter Frequency Relative Accuracy of RSRP test case 9.1.5.2	10.0.0	10.1.0
2012-06	RAN#56	R5-121940	0572	-	Correction to the test mode references for RRM tests	10.0.0	10.1.0
2012-06	RAN#56	R5-121941	0573	-	Addition of new RRM TC 6.3.5: E-UTRA TDD RRC connection release redirection to UTRA TDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121942	0574	-	RRM: Introduction of Annex for handling of different releases and UE capabilities	10.0.0	10.1.0
2012-06	RAN#56	R5-121969	0575	-	Adding operating band 26 to TS 36.521-3	10.0.0	10.1.0

2012-06	RAN#56	R5-121977	0576	-	Change in transmit timing tests based on DRX feature group indicator	10.0.0	10.1.0
2012-06	RAN#56	R5-121980	0577	-	Clarifications to FDD RSRQ for E-UTRA Carrier Aggregation	10.0.0	10.1.0
2012-06	RAN#56	R5-121981	0578	-	Clarifications to TDD RSRQ for E-UTRA Carrier Aggregation	10.0.0	10.1.0
2012-06	RAN#56	R5-121991	0579	-	Further Test Tolerance analysis for operating band 25 and 41 in 36.521-3	10.0.0	10.1.0
2012-06	RAN#56	R5-121998	0580	-	Addition of new RRM TC 6.3.6: E-UTRA FDD RRC connection release redirection to UTRA TDD	10.0.0	10.1.0
2012-06	RAN#56	R5-121999	0581	-	Addition of new RRM TC 8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-122000	0582	-	Addition of new RRM TC 8.7.4 E-UTRA TDD-UTRA TDD enhanced cell identification under AWGN propagation conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-122001	0583	-	Addition of new RRM TC 8.9.2 E-UTRA FDD-UTRA TDD enhanced cell identification under AWGN propagation conditions	10.0.0	10.1.0
2012-06	RAN#56	R5-122002	0584	-	RRM: Clarifications to the OCNG patterns	10.0.0	10.1.0
2012-06	RAN#56	R5-122007	0556	-	Correction to SR Config Index for TDD DRX test cases	10.0.0	10.1.0
2012-09	RAN#57	R5-123065	0585	-	Correction to References in Annex I	10.1.0	10.2.0
2012-09	RAN#57	R5-123149	0587	-	Corrections to E-UTRAN FDD intra frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123151	0588	-	Corrections to E-UTRAN FDD inter frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123152	0589	-	Corrections to E-UTRAN TDD intra frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123153	0590	-	Corrections to E-UTRAN TDD inter frequency measurements requirements	10.1.0	10.2.0
2012-09	RAN#57	R5-123163	0591	-	Introduction of E-UTRAN TDD-TDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.1.0	10.2.0
2012-09	RAN#57	R5-123166	0592	-	Correction to FDD RSRQ for E-UTRA Carrier Aggregation tests	10.1.0	10.2.0
2012-09	RAN#57	R5-123167	0593	-	Correction to TDD RSRQ for E-UTRA Carrier Aggregation tests	10.1.0	10.2.0
2012-09	RAN#57	R5-123168	0594	-	Introduction of default RRC messages exceptions for Carrier Aggregation	10.1.0	10.2.0
2012-09	RAN#57	R5-123281	0596	-	Addition of new TC 4.6.2.1 E-UTRAN TDD-cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority	10.1.0	10.2.0
2012-09	RAN#57	R5-123290	0597	-	Addition of new TC 8.18.1 E-UTRAN TDD-HRPD event triggered reporting under fading propagation conditions	10.1.0	10.2.0
2012-09	RAN#57	R5-123291	0598	-	Addition of new TC 8.19.1 E-UTRAN TDD-CDMA2000 1X event triggered reporting under fading propagation conditions	10.1.0	10.2.0
2012-09	RAN#57	R5-123292	0599	-	Annex H message content updates	10.1.0	10.2.0
2012-09	RAN#57	R5-123301	0600	-	Addition of Cell configuration mapping for new RRM test cases	10.1.0	10.2.0
2012-09	RAN#57	R5-123335	0601	-	Correction to transmit timing test cases	10.1.0	10.2.0
2012-09	RAN#57	R5-123336	0602	-	Addition of band indicator for GERAN	10.1.0	10.2.0
2012-09	RAN#57	R5-123426	0603	-	RRM: Update of Annex J	10.1.0	10.2.0
2012-09	RAN#57	R5-123903	0606	-	Addition of new RRM TC 4.5.2.1 E-UTRAN TDD-HRPD Cell Reselection: HRPD is of Lower Priority	10.1.0	10.2.0
2012-09	RAN#57	R5-123904	0607	-	Addition of new TC 5.3.5 E-UTRAN TDD-HRPD Handover	10.1.0	10.2.0
2012-09	RAN#57	R5-123905	0608	-	Addition of new TC 6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123906	0609	-	Addition of new TC 6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	10.1.0	10.2.0
2012-09	RAN#57	R5-123907	0610	-	Addition of new TC 6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123908	0611	-	Addition of new TC 6.3.11 Redirection from E-UTRAN TDD to GERAN when System Information is not provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123916	0612	-	Introduction of Chapter9 absolute and relative RSRP measurement test cases for carrier aggregation (TC 9.1.6.1 and 9.1.6.2)	10.1.0	10.2.0
2012-09	RAN#57	R5-123920	0613	-	Uncertainties and Test Tolerances for E-UTRAN FDD, TDD Inter frequency reselection in the existence of non-allowed CSG cell Test cases 4.2.7 and 4.2.8	10.1.0	10.2.0
2012-09	RAN#57	R5-123935	0614	-	Addition of new TC 5.3.6 E-UTRAN TDD-cdma2000 1X Handover	10.1.0	10.2.0
2012-09	RAN#57	R5-123936	0615	-	Addition of new TC 6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	10.1.0	10.2.0

2012-09	RAN#57	R5-123937	0616	-	Addition of new TC 6.3.12 E-UTRAN TDD RRC connection release redirection to UTRAN FDD without SI provided	10.1.0	10.2.0
2012-09	RAN#57	R5-123938	0617	-	Addition of new TC 9.2.4A.1 FDD - TDD Inter Frequency Absolute RSRQ Accuracy	10.1.0	10.2.0
2012-09	RAN#57	R5-123939	0618	-	Addition of new TC 9.2.4A.2 FDD - TDD Inter Frequency Relative Accuracy of RSRQ	10.1.0	10.2.0
2012-09	RAN#57	R5-123940	0619	-	Addition of new TC 8.14.3 E-UTRAN TDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	10.1.0	10.2.0
2012-09	RAN#57	R5-123941	0620	-	Addition of new TC 8.15.3 E-UTRAN FDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps	10.1.0	10.2.0
2012-09	RAN#57	R5-123959	0621	-	Introduction of E-UTRAN FDD-FDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.1.0	10.2.0
2012-09	RAN#57	R5-123960	0622	-	Introduction of E-UTRAN Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA in Annex	10.1.0	10.2.0
2012-09	RAN#57	R5-123995	0623	-	Addition of new TC 8.14.2 E-UTRAN TDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	10.1.0	10.2.0
2012-09	RAN#57	R5-123996	0624	-	Addition of new TC 8.15.2 E-UTRAN FDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	10.1.0	10.2.0
2012-09	RAN#57	R5-123998	0625	-	RRM: Further avoidance of frequency overlapping for inter-frequency and inter-RAT	10.1.0	10.2.0
2012-09	RAN#57	R5-123999	0626	-	Adding clauses in TS36.521-3 with references for positioning test cases	10.1.0	10.2.0
2012-09	RAN#57	R5-123789	0605	-	Implementation of only partly implemented CR: Clarification of the release of UTRAN-EUTRAN Inter-RAT RRM test cases in 36.521-3	10.2.0	10.2.1
2012-12	RAN#58	R5-124155	0667	-	New TC(8.20) introduction of inter-frequency/RAT measurements in CA mode	10.3.0	10.4.0
2012-12	RAN#58	R5-124172	0668	-	Correction to TC 8.16.3 E-UTRAN FDD-FDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.3.0	10.4.0
2012-12	RAN#58	R5-124173	0669	-	Corrections to TC 8.16.4 E-UTRAN TDD-TDD Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX for CA	10.3.0	10.4.0
2012-12	RAN#58	R5-124174	0670	-	Introduction of default RRC messages exceptions for Carrier Aggregation	10.3.0	10.4.0
2012-12	RAN#58	R5-124180	0671	-	Addition of new cell configuration mapping for CA related test cases	10.3.0	10.4.0
2012-12	RAN#58	R5-125209	0627	-	RRM TC 9.1.6.1: General updates and corrections	10.3.0	10.4.0
2012-12	RAN#58	R5-125210	0628	-	RRM TC 9.1.6.2: General updates and corrections	10.3.0	10.4.0
2012-12	RAN#58	R5-125328	0629	-	RRM Annex C: Addition of physical channel settings for eICIC tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125335	0630	-	RRM Annex A: Addition of measurement channels for eICIC tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125337	0631	-	RRM New TC 7.3.9: Test skeleton for E-UTRAN FDD Radio Link Monitoring Out-of-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125338	0632	-	RRM New TC 7.3.10: Test skeleton for E-UTRAN TDD Radio Link Monitoring Out-of-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125339	0633	-	RRM New TC 7.3.11: Test skeleton for E-UTRAN FDD Radio Link Monitoring In-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125340	0634	-	RRM New TC 7.3.12: Test skeleton for E-UTRAN TDD Radio Link Monitoring In-sync with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125341	0635	-	RRM New TC 8.1.7: Test skeleton for E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125342	0636	-	RRM New TC 8.2.5: Test skeleton for E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting with non-MBSFN ABS	10.3.0	10.4.0
2012-12	RAN#58	R5-125344	0637	-	RRM TC 9.6.2: General corrections	10.3.0	10.4.0
2012-12	RAN#58	R5-125363	0638	-	Update Test cases 5.2.3+5.2.6 uncertainties for >3GHz	10.3.0	10.4.0
2012-12	RAN#58	R5-125364	0639	-	Fading margin for RRM Test cases 8.3.1, 8.3.2, 8.4.1, 8.4.2, 8.14.1 and 8.15.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125366	0640	-	Procedure and requirements for Test cases 4.2.7 and 4.2.8	10.3.0	10.4.0
2012-12	RAN#58	R5-125368	0641	-	Correction of RSRP values in the Test Requirement for RRM Test case 5.3.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125382	0642	-	Clean up of TDD related RRM tests in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125427	0643	-	Correction to TC 9.2.5.1 FDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0

2012-12	RAN#58	R5-125430	0644	-	Correction to TC 9.2.6.1 TDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125538	0645	-	RRM TC 9.6.1: Introduction of GSM RSSI accuracy for E-UTRAN FDD	10.3.0	10.4.0
2012-12	RAN#58	R5-125549	0646	-	Uncertainties and Test Tolerances for TC 4.5.2.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125551	0647	-	Uncertainties and Test Tolerances for TC 5.3.5	10.3.0	10.4.0
2012-12	RAN#58	R5-125553	0648	-	Uncertainties and Test Tolerances for TC 8.14.2	10.3.0	10.4.0
2012-12	RAN#58	R5-125555	0649	-	Uncertainties and Test Tolerances for TC 8.15.2	10.3.0	10.4.0
2012-12	RAN#58	R5-125557	0650	-	Uncertainties and Test Tolerances for TC 8.14.3 and 8.15.3	10.3.0	10.4.0
2012-12	RAN#58	R5-125559	0651	-	Uncertainties and Test Tolerances for TC 9.2.4A.1	10.3.0	10.4.0
2012-12	RAN#58	R5-125561	0652	-	Uncertainties and Test Tolerances for TC 9.2.4A.2	10.3.0	10.4.0
2012-12	RAN#58	R5-125576	0665	-	Correction to Table 9.2.1.1.5-2 in subclause 9.2.1.1.5	10.3.0	10.4.0
2012-12	RAN#58	R5-125812	0653	-	Correction to RRM 9.3.1 in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125813	0654	-	Addition of new TC 8.16.1 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX including uncertainties and Test Tolerances	10.3.0	10.4.0
2012-12	RAN#58	R5-125814	0655	-	Addition of new TC 8.16.2 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX including uncertainties and Test Tolerances	10.3.0	10.4.0
2012-12	RAN#58	R5-125865	0656	-	Introduction of Band 27 to TS 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125878	0657	-	Correction to TC 9.2.5.2 FDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125879	0658	-	Correction to TC 9.2.6.2 TDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.3.0	10.4.0
2012-12	RAN#58	R5-125888	0659	-	Correction to accuracy requirements in RSRP/RSRQ test for Band 26in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125889	0660	-	Correction to RRM 9.4.1 in 36.521-3	10.3.0	10.4.0
2012-12	RAN#58	R5-125922	0661	-	Update Test Procedure and Test Tolerances for UE Transmit Timing Accuracy	10.3.0	10.4.0
2012-12	RAN#58	R5-126045	0663	-	Addition of a new TC 9.1.7.1 TDD Absolute RSRP Accuracy E-UTRA for Carrier Aggregation	10.3.0	10.4.0
2012-12	RAN#58	R5-126046	0664	-	Addition of a new TC 9.1.7.2 TDD Relative RSRP Accuracy E-UTRA for Carrier Aggregation	10.3.0	10.4.0
2012-12	RAN#58	R5-126064	0662	-	Correction to RRM 4.2.7 in 36.521-3	10.3.0	10.4.0
2013-03	RAN#59	R5-130058	0666	-	Uncertainties and Test Tolerances for RRM test cases 9.1.6.1 and 9.1.7.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130060	0667	-	Uncertainties and Test Tolerances for RRM test cases 9.1.6.2 and 9.1.7.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130062	0668	-	Uncertainties and Test Tolerances for RRM test cases 9.2.5.1 and 9.2.6.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130162	0705	-	Modifying test requirements for handover test from E-UTRAN to UTRAN TDD	10.4.0	10.5.0
2013-03	RAN#59	R5-130290	0669	-	RRM:Corrections to TC 9.3.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130300	0670	-	RRM: Corrections to TC 9.6.1	10.4.0	10.5.0
2013-03	RAN#59	R5-130301	0671	-	RRM: Corrections to TC 9.6.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130302	0672	-	Editors note for test cases where Test Requirement not valid above 3GHz	10.4.0	10.5.0
2013-03	RAN#59	R5-130395	0673	-	Uncertainties and Test Tolerances for TC 6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD	10.4.0	10.5.0
2013-03	RAN#59	R5-130396	0674	-	Uncertainties and Test Tolerances for TC 6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided	10.4.0	10.5.0
2013-03	RAN#59	R5-130397	0675	-	Uncertainties and Test Tolerances for TC 6.3.9 Redirection from E-UTRAN FDD to UTRAN FDD without System Information	10.4.0	10.5.0
2013-03	RAN#59	R5-130398	0676	-	Uncertainties and Test Tolerances for TC 6.3.10 Redirection from E-UTRAN FDD to GERAN when System Information is not provided	10.4.0	10.5.0
2013-03	RAN#59	R5-130430	0677	-	Correction to RRM 4.2.7 and 4.2.8	10.4.0	10.5.0
2013-03	RAN#59	R5-130436	0678	-	Update of cell configuration mapping in Annex E	10.4.0	10.5.0
2013-03	RAN#59	R5-130468	0706	-	Correction to RRM measurement accuracy tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130803	0680	-	Updates to TC 8.16.3 and 8.16.4	10.4.0	10.5.0
2013-03	RAN#59	R5-130931	0683	-	Update Test Procedure and Test Tolerances for UE Transmit Timing Accuracy	10.4.0	10.5.0
2013-03	RAN#59	R5-130932	0684	-	Uncertainties and Test Tolerances for RRM test cases 9.2.5.2 and 9.2.6.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130934	0685	-	Test Tolerances to TCs 8.16.3 and 8.16.4 Event Triggered reporting on deactivated SCell with PCell interruption in non-DRX	10.4.0	10.5.0
2013-03	RAN#59	R5-130781	0686	-	RRM: Updates and corrections to TC 8.1.5	10.4.0	10.5.0
2013-03	RAN#59	R5-130943	0687	-	Correction to sr-ConfigIndex in RRM FDD-TDD dual mode tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130953	0688	-	CA RRM: Corrections to tests with independent events	10.4.0	10.5.0

2013-03	RAN#59	R5-130962	0689	-	Add structure for new eICIC test cases 9.2.7.1 and 9.2.8.1, FDD and TDD RSRQ	10.4.0	10.5.0
2013-03	RAN#59	R5-130981	0690	-	Introduction of Chapter 9 RRM test cases for RSRP accuracy for FDD EUTRA -eICIC	10.4.0	10.5.0
2013-03	RAN#59	R5-130982	0691	-	Introduction of Chapter 9 RRM test cases for RSRP accuracy for TDD EUTRA -eICIC	10.4.0	10.5.0
2013-03	RAN#59	R5-130983	0692	-	Additions to TC 8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	10.4.0	10.5.0
2013-03	RAN#59	R5-130984	0693	-	Additions to TC 8.16.4 E-UTRAN TDD-TDD Event triggered reporting on deactivated SCell with PCell interruption in non-DRX	10.4.0	10.5.0
2013-03	RAN#59	R5-130985	0694	-	Additions to TC 9.2.5.1 FDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130986	0695	-	Additions to TC 9.2.5.2 FDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130987	0696	-	Additions to TC 9.2.6.1 TDD Absolute RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130988	0697	-	Additions to TC 9.2.6.2 TDD Relative RSRQ for E-UTRA Carrier Aggregation tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130989	0698	-	Updates to TC 8.16.1 and 8.16.2	10.4.0	10.5.0
2013-03	RAN#59	R5-130990	0699	-	Updates to TCs in section 8.20	10.4.0	10.5.0
2013-03	RAN#59	R5-130991	0700	-	Updates to TCs about FDD and TDD RSRP accuracy for E-UTRA CA	10.4.0	10.5.0
2013-03	RAN#59	R5-130992	0701	-	Updates to TCs about FDD and TDD RSRQ accuracy for E-UTRA CA	10.4.0	10.5.0
2013-03	RAN#59	R5-130993	0702	-	Updates to H.4 default RRC message content for CA	10.4.0	10.5.0
2013-03	RAN#59	R5-130995	0703	-	Correction to RRC Connection Release with Redirection tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130782	0704	-	Correction to new CGI E-UTRA cell with autonomous gaps tests	10.4.0	10.5.0
2013-03	RAN#59	R5-130452	0679	-	Adding operating bands 28 and 44 to Annex I in TS36.521-3	10.5.0	11.0.0
2013-03	RAN#59	R5-130906	0681	-	Introduction of Band 44 for APAC 700 MHz	10.5.0	11.0.0
2013-03	RAN#59	R5-130907	0682	-	Introduction of Band 28 for APAC 700 MHz	10.5.0	11.0.0
2013-06	RAN#60	R5-131105	0707	-	Correction to Test requirement for tests 7.1.X	11.0.0	11.1.0
2013-06	RAN#60	R5-131109	0708	-	eICIC RRM: Addition of MBSFN ABS configuration in annex	11.0.0	11.1.0
2013-06	RAN#60	R5-131110	0709	-	eICIC RRM: Further specification of TC 7.3.9	11.0.0	11.1.0
2013-06	RAN#60	R5-131111	0710	-	eICIC RRM: Further specification of TC 7.3.10	11.0.0	11.1.0
2013-06	RAN#60	R5-131112	0711	-	eICIC RRM: Further specification of TC 7.3.11	11.0.0	11.1.0
2013-06	RAN#60	R5-131113	0712	-	eICIC RRM: Further specification of TC 7.3.12	11.0.0	11.1.0
2013-06	RAN#60	R5-131118	0713	-	CA RRM: References to connection diagrams	11.0.0	11.1.0
2013-06	RAN#60	R5-131148	0714	-	Updates to RRM test case for CA band combo CA_2A-29A	11.0.0	11.1.0
2013-06	RAN#60	R5-131177	0715	-	RRM: FGI bit support in test applicability statement	11.0.0	11.1.0
2013-06	RAN#60	R5-131178	0716	-	RRM TC 9.6: Clarification on testing requirement when no BCCH1 report available	11.0.0	11.1.0
2013-06	RAN#60	R5-131180	0718	-	RRM: Uncertainties and test tolerances for TCs 8.1.5 and 8.1.6	11.0.0	11.1.0
2013-06	RAN#60	R5-131182	0719	-	RRM: Uncertainties and test tolerances for TCs 8.3.4 and 8.3.5	11.0.0	11.1.0
2013-06	RAN#60	R5-131185	0720	-	RRM TC 8.14.2: Minor correction to cross references	11.0.0	11.1.0
2013-06	RAN#60	R5-131186	0721	-	RRM: Several corrections to CGI related test cases	11.0.0	11.1.0
2013-06	RAN#60	R5-131282	0722	-	Uncertainties and Test Tools for eICIC RRM test cases 9.2.7.1, 9.2.8.1	11.0.0	11.1.0
2013-06	RAN#60	R5-131286	0723	-	Uncertainties and Test Tools for RRM test cases 8.11.5, 8.11.6	11.0.0	11.1.0
2013-06	RAN#60	R5-131288	0724	-	Uncertainties and Test Tools for RRM test cases 9.5.1, 9.5.2	11.0.0	11.1.0
2013-06	RAN#60	R5-131291	0725	-	Cleanup of Annex F Introductory Text	11.0.0	11.1.0
2013-06	RAN#60	R5-131403	0726	-	Uncertainties and Test Tolerances for TS 36.521-3 test cases 5.2.4 and 5.2.5	11.0.0	11.1.0
2013-06	RAN#60	R5-131404	0727	-	Uncertainties and Test Tolerances for TS 36.521-3 test case 8.5.4	11.0.0	11.1.0
2013-06	RAN#60	R5-131405	0728	-	Uncertainties and Test Tolerances for TS 36.521-3 test cases 8.7.4 and 8.9.2	11.0.0	11.1.0
2013-06	RAN#60	R5-131445	0729	-	Addition of inter-freq/RAT without measurement gaps TCs	11.0.0	11.1.0
2013-06	RAN#60	R5-131463	0730	-	Uncertainties and Test Tolerances for RRM test cases 6.3.2 and 6.3.12	11.0.0	11.1.0
2013-06	RAN#60	R5-131468	0731	-	Uncertainties and Test Tolerances for RRM test cases 6.3.5+6.3.6+6.3.7+6.3.8	11.0.0	11.1.0
2013-06	RAN#60	R5-131469	0732	-	Modification to test cases 8.7.1 and 8.7.2	11.0.0	11.1.0

2013-06	RAN#60	R5-131517	0733	-	Corrections to RRM requirements for interruption in single CA	11.0.0	11.1.0
2013-06	RAN#60	R5-131529	0734	-	Corrections for RSRQ E-UTRA CA	11.0.0	11.1.0
2013-06	RAN#60	R5-131586	0735	-	Correction to the test cases with the existence of non-allowed CSG cell	11.0.0	11.1.0
2013-06	RAN#60	R5-131590	0736	-	Correction to PRACH configuration	11.0.0	11.1.0
2013-06	RAN#60	R5-131591	0737	-	Correction to Time Alignment Timer	11.0.0	11.1.0
2013-06	RAN#60	R5-131613	0738	-	Editors note for test cases where Test Requirement not valid above 3GHz, clause 8	11.0.0	11.1.0
2013-06	RAN#60	R5-131615	0739	-	Editors note for test cases where Test Requirement not valid above 3GHz, clause 8 - 9	11.0.0	11.1.0
2013-06	RAN#60	R5-131740	0740	-	Corrections of band 26 notes in TS36.521-3	11.0.0	11.1.0
2013-06	RAN#60	R5-131913	0741	-	Change the IE value of System Information Block type 19 for TS36.521-3 TDD test case 4.3.4.1.	11.0.0	11.1.0
2013-06	RAN#60	R5-131922	0742	-	eICIC RRM: Further specification of TC 8.1.7	11.0.0	11.1.0
2013-06	RAN#60	R5-131923	0743	-	eICIC RRM: Further specification of TC 8.2.5	11.0.0	11.1.0
2013-06	RAN#60	R5-131924	0744	-	Structure for new TCs 9.1.8.1, 9.1.8.2, FDD Absolute and Relative eICIC RSRP, Non-MBSFN	11.0.0	11.1.0
2013-06	RAN#60	R5-131925	0745	-	Structure for new TCs 9.1.9.1, 9.1.9.2, TDD Absolute and Relative eICIC RSRP, Non-MBSFN	11.0.0	11.1.0
2013-06	RAN#60	R5-131926	0746	-	Procedure and messages for eICIC RRM test cases 9.2.7.1, 9.2.8.1	11.0.0	11.1.0
2013-06	RAN#60	R5-131938	0747	-	Uncertainties and Test Tolerances for RRM test cases 6.3.4 and 6.3.11	11.0.0	11.1.0
2013-06	RAN#60	R5-131940	0748	-	RRM: Uncertainties and test tolerances for TCs 9.6.1 and 9.6.2	11.0.0	11.1.0
2013-06	RAN#60	R5-131965	0749	-	Correction to RRC Connection Release with Redirection tests	11.0.0	11.1.0
2013-06	RAN#60	R5-131966	0750	-	Correction to Monitored UTRA cell list size	11.0.0	11.1.0
2013-06	RAN#60	R5-131967	0751	-	Correction to UE Transmit Timing Accuracy	11.0.0	11.1.0
2013-06	RAN#60	R5-131986	0752	-	Editors note for test cases where Test Requirement not valid above 3GHz, clauses 4 to 7	11.0.0	11.1.0
2013-06	RAN#60	R5-131992	0753	-	Addition of Chapter 9 RRM test cases for absolute RSRQ accuracy under Time-Domain Measurement Resource Restriction with MBSFN ABS	11.0.0	11.1.0
2013-06	RAN#60	R5-132075	0754	-	Correction to new CGI E-UTRA cell with autonomous gaps tests	11.0.0	11.1.0
2013-06	RAN#60	R5-132107	0755	-	Update of Annex E	11.0.0	11.1.0
2013-06	RAN#60	R5-132112	0756	-	Correction to Combined E-UTRAN - E-UTRA and GSM cell search	11.0.0	11.1.0
2013-06	RAN#60	R5-132114	0757	-	Addition of Band 27 to overlooked sections of TS 36.521-3	11.0.0	11.1.0
2013-09	RAN#61	R5-133101	0758	-	Uncertainties and Test Tolerances for eICIC Absolute RSRP test cases 9.1.8.1+9.1.9.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133103	0759	-	Uncertainties and Test Tolerances for eICIC Relative RSRP test cases 9.1.8.2+9.1.9.2	11.1.0	11.2.0
2013-09	RAN#61	R5-133105	0760	-	Uncertainties and Test Tolerances update for Inter-freq RSRP Test cases 9.1.3.x and 9.1.4.x	11.1.0	11.2.0
2013-09	RAN#61	R5-133142	0761	-	Addition of test cases 7.3.13 and 7.3.15	11.1.0	11.2.0
2013-09	RAN#61	R5-133220	0762	-	RRM: Uncertainties and test tolerances for TCs 9.6.1 and 9.6.2	11.1.0	11.2.0
2013-09	RAN#61	R5-133351	0764	-	Uncertainties and Test Tolerances update for Intra-freq RSRP Test cases 9.1.1.1 and 9.1.2.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133354	0765	-	Band 28 update for Intra-freq relative RSRP Test case 9.1.1.2	11.1.0	11.2.0
2013-09	RAN#61	R5-133421	0766	-	Correction to Common Exception messages for ReportConfig-A6	11.1.0	11.2.0
2013-09	RAN#61	R5-133430	0767	-	Correction to 8.7.3 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133432	0768	-	Correction to 8.11.5 and 8.11.6 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133433	0769	-	Correction to 9.5.1 and 9.5.2 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133435	0770	-	Correction to Common Exception messages in RLM tests	11.1.0	11.2.0
2013-09	RAN#61	R5-133440	0771	-	Addition of TC 7.3.14 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.1.0	11.2.0
2013-09	RAN#61	R5-133441	0772	-	Addition of TC 7.3.16 E-UTRAN TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.1.0	11.2.0
2013-09	RAN#61	R5-133447	0793	-	Correction of configurations in RSRP TDD absolute and relative accuracy for CA test cases	11.1.0	11.2.0
2013-09	RAN#61	R5-133528	0773	-	Corrections to Conditions for UE Measurements Procedures in RRC_CONNECTED State	11.1.0	11.2.0
2013-09	RAN#61	R5-133722	0763	-	eICIC RRM: Message contents for TC-s 7.3.9-12, 8.1.7 and 8.2.5	11.1.0	11.2.0

2013-09	RAN#61	R5-133727	0788	-	Corrections to RRM CA measurement accuracy CA test cases with PCell and SCell switching	11.1.0	11.2.0
2013-09	RAN#61	R5-133728	0789	-	Correction to E-UTRAN RSRP and RSRQ accuracy for CA test cases of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133729	0791	-	Correction to CGI test cases	11.1.0	11.2.0
2013-09	RAN#61	R5-133809	0774	-	Correction to RRM CA test case 8.16.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133810	0775	-	Correction to RRM CA test case 8.16.3	11.1.0	11.2.0
2013-09	RAN#61	R5-133813	0776	-	Correction to 8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	11.1.0	11.2.0
2013-09	RAN#61	R5-133814	0777	-	Addition of Uplink-downlink configuration in 6.3.5 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133836	0778	-	Cell Timing offsets and Cell Timing uncertainties for CA 8.x and 9.x test cases	11.1.0	11.2.0
2013-09	RAN#61	R5-133842	0779	-	Correction to 9.6.1 and 9.6.2 of 36.521-3	11.1.0	11.2.0
2013-09	RAN#61	R5-133855	0780	-	Addition of new CA TC 8.16.5 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	11.1.0	11.2.0
2013-09	RAN#61	R5-133856	0781	-	Addition of new CA TC 8.16.6 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20 MHz bandwidth	11.1.0	11.2.0
2013-09	RAN#61	R5-133857	0782	-	Addition of new CA TC 9.2.12.1 TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133858	0783	-	Addition of new CA TC 9.2.12.2 TDD Relative RSRQ Accuracy for E-UTRA Carrier Aggregation for 20MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133859	0784	-	Correction to RRM CA test case 8.20.1	11.1.0	11.2.0
2013-09	RAN#61	R5-133860	0785	-	New RRM TC 9.1.13.2 TDD Relative RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133861	0786	-	New RRM TC 9.1.13.1 TDD Absolute RSRP Accuracy for E-UTRA Carrier Aggregation for 20 MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133862	0787	-	Cell configuration mapping for new CA TCs for 20MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133896	0790	-	Addition of RMC and OCNG pattern for CA 20 MHz	11.1.0	11.2.0
2013-09	RAN#61	R5-133901	0792	-	CA RRM: Clarification of applicability and completeness status of CA RRM TC-s	11.1.0	11.2.0
2013-12	RAN#62	R5-134145	0794	-	CA RRM: Uncertainties and test tolerances for TC 9.1.13.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134147	0795	-	CA RRM: Uncertainties and test tolerances for TC 9.1.13.2	11.2.0	11.3.0
2013-12	RAN#62	R5-134149	0796	-	CA RRM: Uncertainties and test tolerances for TC 9.2.12.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134151	0797	-	CA RRM: Uncertainties and test tolerances for TC 9.2.12.2	11.2.0	11.3.0
2013-12	RAN#62	R5-134168	0798	-	Clarification of CGI minimum conformance requirements	11.2.0	11.3.0
2013-12	RAN#62	R5-134186	0799	-	Introduction of TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134187	0800	-	Introduction of TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134188	0801	-	Introduction 9.2.13 FDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134189	0802	-	Introduction 9.2.14 TDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134197	0803	-	Receiver sensitivity relaxation of UE for High and Low operating band	11.2.0	11.3.0
2013-12	RAN#62	R5-134221	0808	-	Uncertainties and Test Tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions test case 8.20.3	11.2.0	11.3.0
2013-12	RAN#62	R5-134223	0809	-	Uncertainties and Test Tolerances for eICIC RSRQ test cases 9.2.9.1 and 9.2.10.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134246	0810	-	Reported value correction for RRM test case 9.1.7.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134319	0811	-	RRM: Correction to FGI bit support for TCs 9.1.5.1 and 9.1.5.2	11.2.0	11.3.0
2013-12	RAN#62	R5-134483	0813	-	Update of cell configuration mapping for eICIC RRM in Annex E	11.2.0	11.3.0
2013-12	RAN#62	R5-134491	0814	-	Correction to InterRat HO test case with UTRAN TDD	11.2.0	11.3.0
2013-12	RAN#62	R5-134492	0815	-	Correction to Cell time offset in TDD Inter-RAT test cases	11.2.0	11.3.0
2013-12	RAN#62	R5-134813	0820	-	eICIC RRM: Editorial corrections to section 7 tests	11.2.0	11.3.0
2013-12	RAN#62	R5-134814	0821	-	Updates to Chapter 9 RSRP and RSRQ accuracy test cases under Time-Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134815	0822	-	Updates to Chapter 7 FDD RLM test cases under Time Domain Measurement Resource Restriction with MBSFN ABS (eICIC)	11.2.0	11.3.0
2013-12	RAN#62	R5-134852	0829	-	Uncertainties and Test Tolerances update for Intra-freq RSRQ Test cases 9.2.1.1 and 9.2.2.1	11.2.0	11.3.0
2013-12	RAN#62	R5-134862	0830	-	RRM: Updates to the reference measurement channels and OCNG patterns	11.2.0	11.3.0
2013-12	RAN#62	R5-134863	0831	-	Introduction of TDD configuration definitions	11.2.0	11.3.0
2013-12	RAN#62	R5-134864	0832	-	Update of RRM Requirements Exceptions	11.2.0	11.3.0
2013-12	RAN#62	R5-134872	0833	-	Clarification of RRM tests for multiple bandwidths	11.2.0	11.3.0

2013-12	RAN#62	R5-134873	0834	-	Addition of new TC E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	11.2.0	11.3.0
2013-12	RAN#62	R5-134874	0835	-	Update of cell configuration mapping for CA in Annex E	11.2.0	11.3.0
2013-12	RAN#62	R5-134990	0837	-	CA RRM: Corrections to CA event triggered tests on deactivated SCell with PCell interruption in non-DRX	11.2.0	11.3.0
2013-12	RAN#62	R5-135066	0853	-	CA RRM: Corrections to the message contents exceptions for some CA 20 MHz test cases	11.2.0	11.3.0
2013-12	RAN#62	R5-134216	0805	-	Introduction of FDD Inter frequency absolute RSRP for 5MHz Bandwidth Test case 9.1.17.1	11.3.0	12.0.0
2013-12	RAN#62	R5-134218	0807	-	Introduction of FDD Intra frequency absolute RSRQ for 5MHz Bandwidth Test case 9.2.17.1	11.3.0	12.0.0
2013-12	RAN#62	R5-134579	0816	-	Introduction of Band 31 to Annex I conditions for RRM measurements	11.3.0	12.0.0
2013-12	RAN#62	R5-134583	0817	-	Addition of new TC 5.2.11 E-UTRAN FDD - UTRAN FDD handover for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134585	0818	-	Addition of new TC 6.2.5 E-UTRAN FDD - Contention Based Random Access Test for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134586	0819	-	Addition of new TC 6.2.6 E-UTRAN FDD - Non-Contention Based Random Access Test for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134819	0823	-	Addition of new TC 9.1.16 FDD Intra frequency RSRP Accuracy for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134820	0824	-	Addition of new TC 9.1.17.2 FDD Inter frequency RSRP Accuracy for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134822	0826	-	Addition of new TC 9.2.18 FDD Inter frequency RSRQ Accuracy for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134823	0827	-	Addition of new TC 9.3.3 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134824	0828	-	Addition of new TC 9.4.3 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-134898	0836	-	Update of band configuration table for Inter Band	11.3.0	12.0.0
2013-12	RAN#62	R5-135033	0838	-	Addition of new TC 4.2.9 E-UTRAN FDD-FDD intra-frequency Cell Re-selection case for 5MHz	11.3.0	12.0.0
2013-12	RAN#62	R5-135034	0839	-	Addition of new TC 4.3.1.4 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority for 5MHz	11.3.0	12.0.0
2013-12	RAN#62	R5-135035	0840	-	Addition of new TC 5.1.9 E-UTRAN FDD-FDD Intra frequency handover for 5MHz	11.3.0	12.0.0
2013-12	RAN#62	R5-135036	0841	-	Addition of new TC 6.1.5 E-UTRAN FDD Intra-frequency RRC Re-establishment for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135037	0842	-	Addition of new TC 7.1.5 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135038	0843	-	Addition of new TC 7.2.3 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135039	0844	-	Addition of new TC 7.3.23 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135040	0845	-	Addition of new TC 7.3.24 E-UTRAN FDD Radio Link Monitoring Test for In-sync for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135041	0846	-	Addition of new TC 7.3.25 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX for 5MHz Bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135042	0847	-	Addition of new TC 8.1.9 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135043	0848	-	Addition of new TC 8.1.10 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135044	0849	-	Addition of new TC 8.5.7 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions for 5MHz bandwidth	11.3.0	12.0.0
2013-12	RAN#62	R5-135047	0850	-	Updates to TCs 4.3.1.2 and 4.3.3	11.3.0	12.0.0
2013-12	RAN#62	R5-135048	0851	-	Updates to TCs 5.2.1 and 5.2.2	11.3.0	12.0.0
2013-12	RAN#62	R5-135049	0852	-	Updates the test system uncertainties and test tolerance for TC 6.2.1, 6.2.2, 6.2.3 and 6.2.4	11.3.0	12.0.0
2014-03	RAN#63	R5-140085	0854	-	CA RRM: Uncertainties and test tolerances for TC 8.20.1 and 8.20.2	12.0.0	12.1.0
2014-03	RAN#63	R5-140088	0855	-	Corrections to UE Transmit Timing minimum requirements	12.0.0	12.1.0
2014-03	RAN#63	R5-140089	0856	-	Corrections to measurements of the SCC with deactivated SCell	12.0.0	12.1.0
2014-03	RAN#63	R5-140090	0857	-	Corrections to TC 8.16.3 E-UTRAN FDD-FDD Event triggered reporting on deactivated SCell with PCell	12.0.0	12.1.0
2014-03	RAN#63	R5-140234	0859	-	Uncertainties and Test Tolerances for FDD Intra frequency relative RSRP for 5MHz Bandwidth Test case 9.1.16.2 and update 9.1.1.2, 9.1.2.2.	12.0.0	12.1.0

2014-03	RAN#63	R5-140236	0860	-	Uncertainties and Test Tolerances for FDD Inter Frequency Absolute RSRQ Accuracy for 5MHz Bandwidth 9.2.18.1, and update Test cases 9.2.3.1, 9.2.4.1.	12.0.0	12.1.0
2014-03	RAN#63	R5-140238	0861	-	Uncertainties and Test Tolerances for FDD Inter Frequency Relative RSRQ Accuracy for 5MHz Bandwidth 9.2.18.2, and update Test cases 9.2.3.2, 9.2.4.2.	12.0.0	12.1.0
2014-03	RAN#63	R5-140240	0862	-	Uncertainties and Test Tolerances for E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions test case 8.20.4	12.0.0	12.1.0
2014-03	RAN#63	R5-140241	0863	-	Noc uncertainty for Test Cases 8.5.1, 8.5.3, 8.5.7 and 8.6.1	12.0.0	12.1.0
2014-03	RAN#63	R5-140255	0864	-	CA RRM: Corrections to event triggered reporting under deactivated SCell in non-DRX tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140259	0865	-	CA RRM: Correction and clarification of messages exception on the maximum number of cells to be measured	12.0.0	12.1.0
2014-03	RAN#63	R5-140289	0867	-	Uncertainties and Test Tolerances for RRM test case 7.3.24	12.0.0	12.1.0
2014-03	RAN#63	R5-140295	0868	-	Uncertainties and Test Tolerances for RRM test case 9.3.3	12.0.0	12.1.0
2014-03	RAN#63	R5-140297	0869	-	Uncertainties and Test Tolerances for RRM test case 9.4.3	12.0.0	12.1.0
2014-03	RAN#63	R5-140301	0870	-	Addition of cell configuration mapping for LTE 450 related test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-140401	0871	-	Introduction of operating band groups to TS36.521-3, clause 3	12.0.0	12.1.0
2014-03	RAN#63	R5-140404	0872	-	Introduction of operating band groups to TS36.521-3, Annex I	12.0.0	12.1.0
2014-03	RAN#63	R5-140423	0873	-	Correction to test applicability of measurement without gaps	12.0.0	12.1.0
2014-03	RAN#63	R5-140483	0874	-	Completion and alignment of 5MHz Bandwidth Test cases 9.1.17.1, 9.2.17.1	12.0.0	12.1.0
2014-03	RAN#63	R5-140501	0875	-	Update of exceptions in eICIC RRM with Non-MBSFN	12.0.0	12.1.0
2014-03	RAN#63	R5-140502	0876	-	Update of eICIC RLM test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-140512	0877	-	Correction of UTRA TDD Redirection tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140513	0878	-	Correction to CA RRM Inter frequency tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140562	0879	-	Correction to GSM RSSI absolute accuracy tests	12.0.0	12.1.0
2014-03	RAN#63	R5-140597	0880	-	TC 9.3.1, 9.4.1 Corrections to test procedures in TS36.521-3	12.0.0	12.1.0
2014-03	RAN#63	R5-140810	0881	-	Correction of b2-threshold for EUTRA and GERAN cell	12.0.0	12.1.0
2014-03	RAN#63	R5-140849	0883	-	Additions to TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140850	0884	-	Additions to TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140851	0885	-	Additions to TC 9.2.13 FDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140852	0886	-	Additions to TC 9.2.14 TDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140853	0887	-	Addition to TC 7.3.21 FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140854	0888	-	Addition to TC 7.3.22 TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140855	0889	-	Addition to TC 9.1.15.2 TDD Intra Frequency Relative RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140863	0890	-	Corrections to minimum requirements for time domain measurement	12.0.0	12.1.0
2014-03	RAN#63	R5-140865	0891	-	Uncertainties and Test Tolerances for RRM test case 9.1.16.1	12.0.0	12.1.0
2014-03	RAN#63	R5-140866	0892	-	Uncertainties and Test Tolerances for RRM test case 9.1.17.2	12.0.0	12.1.0
2014-03	RAN#63	R5-140869	0893	-	Corrections to test cases 8.16.3 and 8.16.4	12.0.0	12.1.0
2014-03	RAN#63	R5-140876	0895	-	Introduction of feICIC to Annex H	12.0.0	12.1.0
2014-03	RAN#63	R5-140882	0896	-	Addition to TC 7.3.19 FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140883	0897	-	Addition to TC 7.3.20 TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0

2014-03	RAN#63	R5-140884	0898	-	Addition to TC 9.1.14.1 FDD Intra Frequency Absolute RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140885	0899	-	Addition to TC 9.1.14.2 FDD Intra Frequency Relative RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-140886	0900	-	Addition to TC 9.1.15.1 TDD Intra Frequency Absolute RSRP Accuracy under TD Measurement Resource Restriction with CRS Assistance Information and Non-MBSFN ABS (feICIC)	12.0.0	12.1.0
2014-03	RAN#63	R5-141021	0901	-	Introduction of operating band groups to TS36.521-3, test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-141022	0902	-	Addition of WB-RSRQ measurement test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-141023	0903	-	Update of intra-band CA cell mapping in Annex E	12.0.0	12.1.0
2014-03	RAN#63	R5-141024	0904	-	Clarification on operating band configuration for inter-RAT RRM test cases	12.0.0	12.1.0
2014-03	RAN#63	R5-141031	0905	-	update to TC 9.4.1 L2W CPICH Ec/No Absolute accuracy	12.0.0	12.1.0
2014-03	RAN#63	R5-141036	0906	-	Addition of new CA RRM TC 7.1.3 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell	12.0.0	12.1.0
2014-03	RAN#63	R5-141037	0907	-	Addition of new CA RRM TC 7.1.4 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell	12.0.0	12.1.0
2014-03	RAN#63	R5-141049	0908	-	Correction to Test2 of UE Transmit Timing Accuracy test cases 7.1.1 and 7.1.2	12.0.0	12.1.0
2014-03	RAN#63	R5-141050	0866	-	Updates Test cases about UE Transmit Timing Accuracy Tests	12.0.0	12.1.0
2014-06	RAN#64	R5-142167	0909	-	Correction of clause 9.2.7.1 in 36.521-3	12.1.0	12.2.0
2014-06	RAN#64	R5-142180	0910	-	Correction on PDSCH allocation in PRS subframe	12.1.0	12.2.0
2014-06	RAN#64	R5-142212	0911	-	Additions to feICIC RRM test cases in Annex F	12.1.0	12.2.0
2014-06	RAN#64	R5-142222	0912	-	Cleanup of operating band groups in TS36.521-3	12.1.0	12.2.0
2014-06	RAN#64	R5-142547	0913	-	Uncertainties and Test Tolerances for eICIC Intra-Frequency Event-Triggered Reporting test cases 8.1.7 and 8.2.5	12.1.0	12.2.0
2014-06	RAN#64	R5-142550	0914	-	Uncertainties and Test Tolerances for eICIC RLM out-of-sync Test cases 7.3.9,7.3.10,7.3.13 and 7.3.14	12.1.0	12.2.0
2014-06	RAN#64	R5-142553	0915	-	Uncertainties and Test Tolerances for eICIC RLM In-sync Test cases 7.3.11,7.3.12,7.3.15 and 7.3.16	12.1.0	12.2.0
2014-06	RAN#64	R5-142600	0916	-	Clean-up of eICIC RRM tests	12.1.0	12.2.0
2014-06	RAN#64	R5-142621	0918	-	Clean-up for E-UTRAN RRM test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-142623	0919	-	Update of Annex E for CA RRM Inter frequency tests for Intra-band	12.1.0	12.2.0
2014-06	RAN#64	R5-143018	0920	-	Correction of clause 9.2.8.1 in 36.521-3	12.1.0	12.2.0
2014-06	RAN#64	R5-143019	0921	-	Update eICIC Absolute RSRP Test cases 9.1.8.1+9.1.9.1	12.1.0	12.2.0
2014-06	RAN#64	R5-143020	0922	-	Update eICIC Absolute RSRQ Test cases 9.2.7.1+9.2.8.1	12.1.0	12.2.0
2014-06	RAN#64	R5-143022	0923	-	Uncertainties and test tolerance for RRM Test case 9.1.10.1, 9.1.11.1	12.1.0	12.2.0
2014-06	RAN#64	R5-143023	0924	-	Uncertainties and test tolerance for RRM Test case 9.1.10.2, 9.1.11.2	12.1.0	12.2.0
2014-06	RAN#64	R5-143024	0925	-	Update to eICIC Absolute RSRQ with MBSFN ABS for chapter 9 RRM test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143057	0926	-	Updates to CA RRM 8.16.x test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143058	0927	-	Correction to UL timing accuracy Tx test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143059	0928	-	Update of Annex E for InterRAT with TDD-TD-SCDMA	12.1.0	12.2.0
2014-06	RAN#64	R5-143062	0929	-	Additions to TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143063	0930	-	Update eICIC Relative RSRP Test cases 9.1.8.2+9.1.9.2	12.1.0	12.2.0
2014-06	RAN#64	R5-143064	0931	-	Additions to TC 9.2.13 FDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143065	0932	-	Additions to TC 9.2.14 TDD RSRQ under Time Domain Measurement Resource Restriction (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143066	0933	-	Addition of RLM test cases with non-MBSFN for fEICIC	12.1.0	12.2.0
2014-06	RAN#64	R5-143067	0934	-	Test Cases 9.1.14.1, 9.1.14.2, 9.1.15.1, 9.1.15.2 for feICIC	12.1.0	12.2.0
2014-06	RAN#64	R5-143085	0935	-	Addition of new TC 8.16.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143086	0936	-	Addition of new TC 9.1.18 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143087	0937	-	Addition of new TC 9.1.19 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 10MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143088	0938	-	Addition of new TC 9.2.21 FDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143089	0939	-	Addition of new TC 9.2.22 TDD RSRQ Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	12.1.0	12.2.0

2014-06	RAN#64	R5-143090	0940	-	Addition of new TC 8.16.14 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143091	0941	-	Addition of new TC 9.1.20 FDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143092	0942	-	Addition of new TC 9.1.21 TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143093	0943	-	Addition of new TC 9.2.23 FDD RSRQ Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143094	0944	-	Addition of new TC 9.2.24 TDD RSRQ Accuracy for E-UTRAN Carrier Aggregation for 5MHz + 5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143102	0945	-	Additions to TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143103	0946	-	Additions to feICIC to Annex H	12.1.0	12.2.0
2014-06	RAN#64	R5-143108	0947	-	Correction to periodicity of ABS pattern in eICIC RRM	12.1.0	12.2.0
2014-06	RAN#64	R5-143112	0948	-	Additions to TDD interruption requirements for SCell	12.1.0	12.2.0
2014-06	RAN#64	R5-143152	0949	-	Correction to event triggered reporting tests for CA	12.1.0	12.2.0
2014-06	RAN#64	R5-143153	0950	-	Correction to Intra CA test cases	12.1.0	12.2.0
2014-06	RAN#64	R5-143157	0951	-	TC 7.3.19 FDD Radio Link Monitoring for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143158	0952	-	TC 7.3.20 TDD Radio Link Monitoring for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and Non-MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143159	0953	-	TC 7.3.21 FDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143160	0954	-	TC 7.3.22 TDD Radio Link Monitoring Test for In-sync under Time Domain Measurement Resource Restriction with CRS assistance information and MBSFN ABS (feICIC)	12.1.0	12.2.0
2014-06	RAN#64	R5-143172	0955	-	Addition of new TC 8.16.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 10MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143173	0956	-	Addition of new TC 8.16.13 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX for 5MHz+5MHz	12.1.0	12.2.0
2014-06	RAN#64	R5-143176	0957	-	Addition of new TC 8.16.7 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20 MHz bandwidth	12.1.0	12.2.0
2014-06	RAN#64	R5-143191	0958	-	Clarification of tracking area updating procedure	12.1.0	12.2.0
2014-06	RAN#64	R5-143209	0917	1	Correction to 9.6.2 GSM RSSI accuracy for E-UTRAN TDD	12.1.0	12.2.0
2014-06	RAN#64	-	-	-	Correction of misplaced Table F.3.2-1 entry of R5-142547	12.2.0	12.2.1
2014-09	RAN#65	R5-144124	0959	-	Corrections to RRM Physical Cell Id (PCI) Configuration Conditions in feICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144169	0962	-	RRM: Corrections to TCs 9.2.18.x (5MHz)	12.2.1	12.3.0
2014-09	RAN#65	R5-144170	0963	-	eICIC RRM: Corrections to TCs 7.3.14 and 7.3.16	12.2.1	12.3.0
2014-09	RAN#65	R5-144171	0964	-	RRM: Removal of redundant (time limited) editor's notes	12.2.1	12.3.0
2014-09	RAN#65	R5-144172	0965	-	CA RRM: Correction of wrong test applicability	12.2.1	12.3.0
2014-09	RAN#65	R5-144197	0966	-	Addition of new RRM TC 8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	12.2.1	12.3.0
2014-09	RAN#65	R5-144202	0967	-	Addition of new RRM TC 8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144355	0973	-	Correction to Inter-frequency event triggered reporting test in 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144356	0974	-	Correction to InterRAT event triggered reporting test in 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144357	0975	-	Update of Annex E	12.2.1	12.3.0
2014-09	RAN#65	R5-144361	0976	-	Correction to CQI reporting periodicity in RLM with eICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144362	0977	-	Addition of message exceptions for eICIC test cases with MBSFN	12.2.1	12.3.0
2014-09	RAN#65	R5-144767	0979	-	Uncertainties and Test Tolerances for RRM TCs 8.16.7+8.16.8	12.2.1	12.3.0
2014-09	RAN#65	R5-144768	0980	-	Uncertainties and Test Tolerances for RRM TCs 8.16.5+8.16.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144785	0988	-	Uncertainties and test tolerance for 36.521-3 Test case 9.4.1, 9.4.2 and 9.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144788	0978	-	Updates to Annex I of TS 36.521-3	12.2.1	12.3.0

2014-09	RAN#65	R5-144810	0981	-	Antenna correlation for RRM Test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144811	0982	-	Correction to RRM event triggered tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144812	0983	-	Correction to E-UTRAN CA Measurements	12.2.1	12.3.0
2014-09	RAN#65	R5-144830	0984	-	Uncertainties and Test Tolerances for Test case 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144832	0985	-	Uncertainties and Test Tolerances for Test case 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144833	0986	-	Uncertainties and Test Tolerances update for Test cases 8.3.3+8.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144850	0989	-	Addition of new RRM TC 8.16.12 E-UTRAN TDD Event triggered reporting on deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144851	0990	-	Cell configuration mapping for 5MHz+5MHz and 10MHz+5MHz test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144852	0991	-	Addition of new RRM TC 8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144858	0992	-	Update to test procedure for GSM carrier measurement test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144908	0993	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144909	0994	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144910	0995	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144912	0996	-	Removable of editor's notes for maxReportCells	12.2.1	12.3.0
2014-09	RAN#65	R5-144913	0997	-	Correction to neighCellConfig of MeasObjectEUTRA in CGI tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144927	0998	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144124	0959	-	Corrections to RRM Physical Cell Id (PCI) Configuration Conditions in feICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144169	0962	-	RRM: Corrections to TCs 9.2.18.x (5MHz)	12.2.1	12.3.0
2014-09	RAN#65	R5-144170	0963	-	eICIC RRM: Corrections to TCs 7.3.14 and 7.3.16	12.2.1	12.3.0
2014-09	RAN#65	R5-144171	0964	-	RRM: Removal of redundant (time limited) editor's notes	12.2.1	12.3.0
2014-09	RAN#65	R5-144172	0965	-	CA RRM: Correction of wrong test applicability	12.2.1	12.3.0
2014-09	RAN#65	R5-144197	0966	-	Addition of new RRM TC 8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	12.2.1	12.3.0
2014-09	RAN#65	R5-144202	0967	-	Addition of new RRM TC 8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144355	0973	-	Correction to Inter-frequency event triggered reporting test in 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144356	0974	-	Correction to InterRAT event triggered reporting test in 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144357	0975	-	Update of Annex E	12.2.1	12.3.0
2014-09	RAN#65	R5-144361	0976	-	Correction to CQI reporting periodicity in RLM with eICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144362	0977	-	Addition of message exceptions for eICIC test cases with MBSFN	12.2.1	12.3.0
2014-09	RAN#65	R5-144767	0979	-	Uncertainties and Test Tolerances for RRM TCs 8.16.7+8.16.8	12.2.1	12.3.0
2014-09	RAN#65	R5-144768	0980	-	Uncertainties and Test Tolerances for RRM TCs 8.16.5+8.16.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144785	0988	-	Uncertainties and test tolerance for 36.521-3 Test case 9.4.1, 9.4.2 and 9.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144788	0978	1	Updates to Annex I of TS 36.521-3	12.2.1	12.3.0
2014-09	RAN#65	R5-144810	0981	-	Antenna correlation for RRM Test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144811	0982	-	Correction to RRM event triggered tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144812	0983	-	Correction to E-UTRAN CA Measurements	12.2.1	12.3.0
2014-09	RAN#65	R5-144830	0984	-	Uncertainties and Test Tolerances for Test case 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144832	0985	-	Uncertainties and Test Tolerances for Test case 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144833	0986	-	Uncertainties and Test Tolerances update for Test cases 8.3.3+8.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144850	0989	-	Addition of new RRM TC 8.16.12 E-UTRAN TDD Event triggered reporting on deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144851	0990	-	Cell configuration mapping for 5MHz+5MHz and 10MHz+5MHz test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144852	0991	-	Addition of new RRM TC 8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144858	0992	-	Update to test procedure for GSM carrier measurement test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144908	0993	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0

2014-09	RAN#65	R5-144909	0994	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144910	0995	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144912	0996	-	Removable of editor's notes for maxReportCells	12.2.1	12.3.0
2014-09	RAN#65	R5-144913	0997	-	Correction to neighCellConfig of MeasObjectEUTRA in CGI tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144927	0998	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144124	0959	-	Corrections to RRM Physical Cell Id (PCI) Configuration Conditions in feICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144169	0962	-	RRM: Corrections to TCs 9.2.18.x (5MHz)	12.2.1	12.3.0
2014-09	RAN#65	R5-144170	0963	-	eICIC RRM: Corrections to TCs 7.3.14 and 7.3.16	12.2.1	12.3.0
2014-09	RAN#65	R5-144171	0964	-	RRM: Removal of redundant (time limited) editor's notes	12.2.1	12.3.0
2014-09	RAN#65	R5-144172	0965	-	CA RRM: Correction of wrong test applicability	12.2.1	12.3.0
2014-09	RAN#65	R5-144197	0966	-	Addition of new RRM TC 8.16.11 E-UTRAN FDD event triggered reporting on deactivating SCell with PCell interruption in non-DRX for 10MHz+5MHz	12.2.1	12.3.0
2014-09	RAN#65	R5-144202	0967	-	Addition of new RRM TC 8.16.16 E-UTRA TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144355	0973	-	Correction to Inter-frequency event triggered reporting test in 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144356	0974	-	Correction to InterRAT event triggered reporting test in 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144357	0975	-	Update of Annex E	12.2.1	12.3.0
2014-09	RAN#65	R5-144361	0976	-	Correction to CQI reporting periodicity in RLM with eICIC	12.2.1	12.3.0
2014-09	RAN#65	R5-144362	0977	-	Addition of message exceptions for eICIC test cases with MBSFN	12.2.1	12.3.0
2014-09	RAN#65	R5-144767	0979	-	Uncertainties and Test Tolerances for RRM TCs 8.16.7+8.16.8	12.2.1	12.3.0
2014-09	RAN#65	R5-144768	0980	-	Uncertainties and Test Tolerances for RRM TCs 8.16.5+8.16.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144785	0988	-	Uncertainties and test tolerance for 36.521-3 Test case 9.4.1, 9.4.2 and 9.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144788	0978	1	Updates to Annex I of TS 36.521-3	12.2.1	12.3.0
2014-09	RAN#65	R5-144810	0981	-	Antenna correlation for RRM Test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144811	0982	-	Correction to RRM event triggered tests	12.2.1	12.3.0
2014-09	RAN#65	R5-144812	0983	-	Correction to E-UTRAN CA Measurements	12.2.1	12.3.0
2014-09	RAN#65	R5-144830	0984	-	Uncertainties and Test Tolerances for Test case 8.3.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144832	0985	-	Uncertainties and Test Tolerances for Test case 8.5.6	12.2.1	12.3.0
2014-09	RAN#65	R5-144833	0986	-	Uncertainties and Test Tolerances update for Test cases 8.3.3+8.4.3	12.2.1	12.3.0
2014-09	RAN#65	R5-144850	0989	-	Addition of new RRM TC 8.16.12 E-UTRAN TDD Event triggered reporting on deactivating Scells and interruption probability (0.5%) without DRX for 10MHz+5MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144851	0990	-	Cell configuration mapping for 5MHz+5MHz and 10MHz+5MHz test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144852	0991	-	Addition of new RRM TC 8.16.15 E-UTRA FDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 5+5 MHz BW	12.2.1	12.3.0
2014-09	RAN#65	R5-144858	0992	-	Update to test procedure for GSM carrier measurement test cases	12.2.1	12.3.0
2014-09	RAN#65	R5-144908	0993	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144909	0994	-	New TC: FDD Intra Frequency Serving Cell Absolute RSRQ Accuracy	12.2.1	12.3.0
2014-09	RAN#65	R5-144910	0995	-	New TC: TDD Intra Frequency Serving Cell Absolute RSRP Accuracy	12.2.1	12.3.0
2014-12	RAN#66	R5-145129	1000	-	CA-RRM: Corrections to TC 8.16.5 and 8.16.6	12.3.0	12.4.0
2014-12	RAN#66	R5-145130	1001	-	RRM: Correction to MBSFN subframes configuration	12.3.0	12.4.0
2014-12	RAN#66	R5-145245	1002	-	eICIC-RRM: Missing uncertainties for TC 8.1.7 and 8.2.5	12.3.0	12.4.0
2014-12	RAN#66	R5-145299	1003	-	Update Uncertainties for Test case 8.5.3	12.3.0	12.4.0
2014-12	RAN#66	R5-145301	1004	-	Uncertainties and Test Tolerances for feICIC RSRQ accuracy Test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145303	1005	-	Uncertainties and Test Tolerances for Test cases 9.2.21.1 and 9.2.22.1	12.3.0	12.4.0
2014-12	RAN#66	R5-145305	1006	-	Uncertainties and Test Tolerances for Test cases 9.2.21.2 and 9.2.22.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145457	1007	-	Addition of new RRM TC 7.1.7 E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145464	1008	-	Corrections to RSRP and RSRQ tests	12.3.0	12.4.0
2014-12	RAN#66	R5-145477	1009	-	Corrections to TC 7.3.20 E-UTRAN TDD RL Monitoring Test for In-sync under for feICIC	12.3.0	12.4.0

2014-12	RAN#66	R5-145488	1011	-	Test Tolerances for TC 8.1.8 E-UTRAN FDD-FDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.3.0	12.4.0
2014-12	RAN#66	R5-145489	1012	-	Test Tolerances for TC 8.2.6 E-UTRAN TDD-TDD Intra-Frequency Event-Triggered Reporting (feICIC)	12.3.0	12.4.0
2014-12	RAN#66	R5-145493	1013	-	Uncertainties and Test Tolerances to Annex F for feICIC RRM test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145501	1014	-	Correction to periodicity of ABS pattern in RRM for feICIC	12.3.0	12.4.0
2014-12	RAN#66	R5-145512	1015	-	Alignment of Annex I	12.3.0	12.4.0
2014-12	RAN#66	R5-145528	1017	-	Editorial removal of brackets from TC 7.3.15	12.3.0	12.4.0
2014-12	RAN#66	R5-145587	1018	-	Update of feICIC Out-Of-Sync test cases with assistance data	12.3.0	12.4.0
2014-12	RAN#66	R5-145639	1019	-	Updates to RRM feICIC test cases in Clause 9	12.3.0	12.4.0
2014-12	RAN#66	R5-145801	1020	-	RRM: Modification of test description to refer to State 2A-RF	12.3.0	12.4.0
2014-12	RAN#66	R5-145802	1021	-	Update of Annex E cell configuration mapping for feICIC	12.3.0	12.4.0
2014-12	RAN#66	R5-145816	1022	-	Updates to RRM TC 7.1.3 and 7.1.4	12.3.0	12.4.0
2014-12	RAN#66	R5-145817	1023	-	Correction to the band group in 9.2.1.1	12.3.0	12.4.0
2014-12	RAN#66	R5-145819	1024	-	Correction to 8.16.6	12.3.0	12.4.0
2014-12	RAN#66	R5-145820	1025	-	Correction to Phys Cell Id of MeasResult in RRM test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145831	1026	-	Uncertainties and Test Tolerances for feICIC Test cases 7.3.17, 7.3.18, 7.3.19, 7.3.20, 7.3.21, 7.3.22	12.3.0	12.4.0
2014-12	RAN#66	R5-145832	1027	-	Uncertainties and Test Tolerances for feICIC test cases 9.1.14.1 and 9.1.15.1	12.3.0	12.4.0
2014-12	RAN#66	R5-145837	1028	-	Uncertainties and Test Tolerances for feICIC test cases 9.1.14.2 and 9.1.15.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145877	1029	-	Addition of new TCs for activation and deactivation of known SCell	12.3.0	12.4.0
2014-12	RAN#66	R5-145878	1030	-	Update to test procedure for LTE CA Event reporting test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145906	1031	-	Addition of new RRM TC 6.2.7 E-UTRAN FDD - Non-Contention Based Random Access Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145907	1032	-	Addition of new RRM TC 6.2.8 E-UTRAN TDD - Non-Contention Based Random Access Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145908	1033	-	Addition of new RRM TC 7.1.6 E-UTRAN FDD - UE Transmit Timing Accuracy Tests for SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145909	1034	-	Addition of new RRM TC 7.2.4 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145910	1035	-	Addition of new RRM TC 7.2.5 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test For SCell in sTAG	12.3.0	12.4.0
2014-12	RAN#66	R5-145911	1036	-	Updates to CA TCs about 10+5MHz and 5+5MHz BW	12.3.0	12.4.0
2014-12	RAN#66	R5-145912	1037	-	New TCs 9.1.12 for FDD RSRP Accuracy for CA 20MHz	12.3.0	12.4.0
2014-12	RAN#66	R5-145913	1038	-	New TCs 9.2.11 for FDD RSRQ Accuracy for CA 20MHz	12.3.0	12.4.0
2014-12	RAN#66	R5-145915	1039	-	Correction to measurement performance test cases 9.3.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145918	1040	-	Update of Annex H for feICIC test cases	12.3.0	12.4.0
2014-12	RAN#66	R5-145919	1041	-	Update of feICIC RLM In-sync test cases with assistance data	12.3.0	12.4.0
2014-12	RAN#66	R5-145927	1042	-	Correction to the test procedure in 9.6.1 and 9.6.2	12.3.0	12.4.0
2014-12	RAN#66	R5-145977	0999	-	CA-RRM: Review of test frequencies in Annex E	12.3.0	12.4.0
2014-12	RAN#66	R5-145982	1010	-	Cell mapping for some RRM TCs	12.3.0	12.4.0
2015-01	-	-	-	-	Re-implementation of R5-145927	12.4.0	12.4.1
2015-01	-	-	-	-	Re-implementation of R5-145911	12.4.0	12.4.1
2015-03	RAN#67	R5-150213	1043	-	Corrections to multicarrier handover from E-UTRA to UTRA requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150218	1044	-	Test Tolerances for 4.3.1.3 E-UTRAN FDD - UTRAN FDD cell re-selection	12.4.1	12.5.0
2015-03	RAN#67	R5-150220	1045	-	Test Tolerance for 4.3.4.3 EUTRA TDD-UTRA TDD cell reselection	12.4.1	12.5.0
2015-03	RAN#67	R5-150222	1046	-	Test Tolerances for 8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150224	1047	-	Test Tolerances for 8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150226	1048	-	Test Tolerances for 8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150228	1049	-	Test Tolerances for 8.8.1+8.10.1 E-UTRAN - GSM event triggered reporting	12.4.1	12.5.0
2015-03	RAN#67	R5-150230	1050	-	Test Tolerances for 8.8.2+8.10.2 E-UTRAN - GSM event triggered reporting when DRX is used	12.4.1	12.5.0
2015-03	RAN#67	R5-150232	1051	-	Uncertainties to Annex F for RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150242	1052	-	Update Uncertainties for Test case 5.1.5	12.4.1	12.5.0
2015-03	RAN#67	R5-150244	1053	-	Update Uncertainties for Test case 5.1.6	12.4.1	12.5.0
2015-03	RAN#67	R5-150246	1054	-	Update Uncertainties for Test case 5.2.3, 5.2.6	12.4.1	12.5.0

2015-03	RAN#67	R5-150256	1055	-	Introduction of Test Cases for RSRQ Accuracy for TDD-FDD CA	12.4.1	12.5.0
2015-03	RAN#67	R5-150306	1056	-	Uncerts and Test Tools for TCs 8.16.11+8.16.12 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150310	1057	-	Uncerts and Test Tools for TCs 8.16.15+8.16.16 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150314	1058	-	Uncerts and Test Tools for TCs 9.1.18.2+9.1.19.2 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150316	1059	-	Uncerts and Test Tools for TCs 9.1.20.1+9.1.21.1 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150318	1060	-	Uncerts and Test Tools for TCs 9.1.20.2+9.1.21.2 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150320	1061	-	RRM: Corrections to event triggered tests without measurement gap	12.4.1	12.5.0
2015-03	RAN#67	R5-150324	1062	-	Uncerts and Test Tools for TCs 9.2.23.1+9.2.24.1 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150327	1063	-	Uncerts and Test Tools for TCs 9.2.23.2+9.2.24.2 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150328	1064	-	Correction to RRM TCs 9.1.6.2 and 9.1.7.2	12.4.1	12.5.0
2015-03	RAN#67	R5-150361	1065	-	Addition of cell mapping for some test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150381	1066	-	Update of Annex E and F for TCs 9.1.12 and 9.2.11	12.4.1	12.5.0
2015-03	RAN#67	R5-150390	1067	-	Correction to test procedure for LTE CA event reporting test case	12.4.1	12.5.0
2015-03	RAN#67	R5-150421	1068	-	Correction to message exceptions in eICIC MBSFN ABS	12.4.1	12.5.0
2015-03	RAN#67	R5-150423	1069	-	Correction to feICIC common exceptions in Annex H	12.4.1	12.5.0
2015-03	RAN#67	R5-150424	1070	-	Clean up on cl.7 and cl.8 feICIC RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150425	1071	-	Clean up on cl.9 feICIC RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150517	1072	-	Error correction to TDD Absolute RSRQ Accuracy for E-UTRA Carrier Aggregation	12.4.1	12.5.0
2015-03	RAN#67	R5-150523	1073	-	Cell configuration mapping for Rel 12 and forward absolute RSRP accuracy RRM cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150526	1074	-	Update R8 intra frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150527	1075	-	Update R8 inter frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150529	1076	-	Update R9 inter frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150530	1077	-	Update R10 intra frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150531	1078	-	Update TDD RSRP Accuracy requirements for Carrier Aggregation	12.4.1	12.5.0
2015-03	RAN#67	R5-150806	1079	-	New TCs: intra frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150807	1080	-	New TCs: inter frequency absolute RSRP accuracy requirements	12.4.1	12.5.0
2015-03	RAN#67	R5-150808	1081	-	New TCs: RSRP absolute accuracy for E-UTRA CA	12.4.1	12.5.0
2015-03	RAN#67	R5-150812	1082	-	New TC: E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX for 20MHz+10MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150813	1083	-	New TC: E-UTRAN TDD event triggered reporting on deactivated SCell with PCell interruption in non-DRX for 20MHz+10MHz bandwidth	12.4.1	12.5.0
2015-03	RAN#67	R5-150814	1084	-	New TC: TDD RSRP Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150815	1085	-	New TC: TDD RSRQ Accuracy for E-UTRAN Carrier Aggregation for 20MHz + 10MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150841	1086	-	Corrections to on time to identify the target UTRA TDD cell for blind redirection	12.4.1	12.5.0
2015-03	RAN#67	R5-150842	1087	-	Update of TCs 9.1.12 for FDD RSRP Accuracy for CA 20MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150843	1088	-	Update TCs 9.2.11 for FDD RSRQ Accuracy for CA 20MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150844	1089	-	Correction to eICIC Radio link monitoring test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150845	1090	-	Clean up on cl.7 and cl.9 eICIC RRM test cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150847	1092	-	Update R11 RSRP Accuracy for E-UTRA Carrier Aggregation for 10MHz+5MHz	12.4.1	12.5.0
2015-03	RAN#67	R5-150852	1093	-	Uncerts and Test Tools for TCs 8.16.13+8.16.14 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150856	1094	-	Uncerts and Test Tools for TCs 8.16.9+8.16.10 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150857	1104	-	RRM: Inter-frequency testing for Band 30	12.4.1	12.5.0
2015-03	RAN#67	R5-150884	1095	-	Cell configuration mapping for 20MHz +10MHz CA RRM new cases	12.4.1	12.5.0
2015-03	RAN#67	R5-150885	1096	-	Editorial correction to 8.14.2 and 8.15.2	12.4.1	12.5.0
2015-03	RAN#67	R5-150886	1097	-	Corrections to RRM test cases in clauses 5 and 8	12.4.1	12.5.0

2015-03	RAN#67	R5-150887	1098	-	Uncerts and Test Tools for TCs 9.1.18.1+9.1.19.1 36.521-3 CR	12.4.1	12.5.0
2015-03	RAN#67	R5-150901	1099	-	CA RRM: Correction to test frequencies and Cell-IDs	12.4.1	12.5.0
2015-03	RAN#67	R5-150902	1100	-	Addition of CA capability in RRM tests	12.4.1	12.5.0
2015-03	RAN#67	R5-150903	1101	-	feICIC RRM: Corrections to Cell-IDs	12.4.1	12.5.0
2015-03	RAN#67	R5-150930	1102	-	RRM: Consideration of unsent measurement reports	12.4.1	12.5.0
2015-03	RAN#67	R5-150908	1103	-	Updates of test procedures in activation and deactivation test cases	12.4.1	12.5.0
2015-06	RAN#68	R5-151126	1107	-	RRM: Corrections to message configuration of TCs 9.3.2 and 9.4.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151127	1108	-	RRM: Corrections to test procedures of TCs 9.3.x and 9.4.x	12.5.0	12.6.0
2015-06	RAN#68	R5-151128	1109	-	CA RRM: Corrections to TC 9.1.24.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151133	1111	-	Uncertainties and Test tolerances for Test cases 9.9.1.1 and 9.9.2.1	12.5.0	12.6.0
2015-06	RAN#68	R5-151135	1112	-	Uncertainties and Test tolerances for Test cases 9.9.1.2 and 9.9.2.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151197	1122	-	Corrections to CPICH Ec/No to CPICH Ec/Io in EUTRA FDD to UTRA FDD HO	12.5.0	12.6.0
2015-06	RAN#68	R5-151277	1129	-	Correction to RRM test case 8.2.4	12.5.0	12.6.0
2015-06	RAN#68	R5-151278	1130	-	Correction to RRM test case 8.11.4	12.5.0	12.6.0
2015-06	RAN#68	R5-151330	1150	-	Addition of band 32 to TS36.521-3	12.5.0	12.6.0
2015-06	RAN#68	R5-151464	1155	-	Correction to applicability of TD-LTE to UTRA TDD periodic measurements	12.5.0	12.6.0
2015-06	RAN#68	R5-151485	1158	-	Update of eICIC meas pattern for PCell, TC 8.2.5	12.5.0	12.6.0
2015-06	RAN#68	R5-151542	1162	-	Uncerts and Test Tools for TC 8.16.21 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151544	1163	-	Uncerts and Test Tools for TC 8.16.22 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151546	1164	-	Uncerts and Test Tools for TCs 9.1.24.1 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151548	1165	-	Uncerts and Test Tools for TCs 9.1.24.1_1 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151550	1166	-	Uncerts and Test Tools for TC 9.1.24.2 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151552	1167	-	Uncerts and Test Tools for TC 9.2.27.1 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151554	1168	-	Uncerts and Test Tools for TC 9.2.27.2 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151830	1105	1	RRM: Consideration of unsent measurement reports in recently added test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151831	1113	1	Test Tolerances for 8.3.1+8.3.2+8.14.1+8.14.2 inter-frequency event triggered reporting under fading propagation conditions	12.5.0	12.6.0
2015-06	RAN#68	R5-151832	1115	1	Test Tolerances for 8.4.1+8.4.2+8.15.1+8.15.2 inter-frequency event triggered reporting under fading propagation conditions	12.5.0	12.6.0
2015-06	RAN#68	R5-151833	1117	1	Test Tolerances for 9.2.4A.1 Absolute Accuracy RSRQ	12.5.0	12.6.0
2015-06	RAN#68	R5-151834	1119	1	Test Tolerances for 9.2.4A.2 Relative Accuracy RSRQ	12.5.0	12.6.0
2015-06	RAN#68	R5-151835	1121	1	Uncertainties to Annex F for above 3GHz RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151838	1127	1	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 4.2.3, 4.2.4, 4.2.5, 4.2.6	12.5.0	12.6.0
2015-06	RAN#68	R5-151844	1128	1	Uncertainties and Test Tolerances for Rel-12 Improved RSRP accuracy	12.5.0	12.6.0
2015-06	RAN#68	R5-151846	1159	1	Update Uncerts and Test Tools for TCs 8.11.1+8.11.2 for frequencies above 3GHz 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151848	1160	1	Update Uncerts and Test Tools for TC 8.11.3 for frequencies above 3GHz 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151850	1161	1	Update Uncerts and Test Tools for TC 8.11.4 for frequencies above 3GHz 36.521-3 CR	12.5.0	12.6.0
2015-06	RAN#68	R5-151861	1171	1	Addition of new RRM TC 8.16.25 E-UTRAN TDD-FDD CA Event Triggered Reporting on Deactivated SCell with PCell interruption in Non-DRX with PCell in FDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151862	1172	1	Addition of new RRM TC 8.16.26 E-UTRAN TDD-FDD CA Event Triggered Reporting on Deactivated SCell with PCell interruption in Non-DRX with PCell in TDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151864	1123	1	Corrections to RRM test cases for Core Alignment	12.5.0	12.6.0
2015-06	RAN#68	R5-151866	1132	1	New TC: E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells for 20 MHz +10 MHz bandwidth	12.5.0	12.6.0
2015-06	RAN#68	R5-151867	1133	1	New TC: E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 20 MHz bandwidth	12.5.0	12.6.0
2015-06	RAN#68	R5-151868	1134	1	New TC: E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions for 20 MHz + 10 MHz bandwidth	12.5.0	12.6.0
2015-06	RAN#68	R5-151869	1135	1	Cell configuration mapping for Rel 12 and forward RSRP relative accuracy RRM cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151870	1136	1	Cell configuration mapping for Rel 12 and forward FDD absolute RSRP accuracy RRM cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151871	1137	1	New TCs: R12 RSRP accuracy in eICIC	12.5.0	12.6.0

2015-06	RAN#68	R5-151872	1138	1	New TCs: R12 RSRP accuracy in FeICIC	12.5.0	12.6.0
2015-06	RAN#68	R5-151873	1139	1	New TCs: RSRP absolute accuracy for FDD E-UTRA CA	12.5.0	12.6.0
2015-06	RAN#68	R5-151874	1140	1	New TCs: R12 inter frequency relative accuracy of RSRP	12.5.0	12.6.0
2015-06	RAN#68	R5-151875	1141	1	Update of R12 CA RSRP measurement accuracy test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151876	1142	1	Update of R12 RSRP inter frequency measurement accuracy test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151877	1143	1	Update of R12 RSRP intra frequency measurement accuracy test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151878	1144	1	Update test applicabilities for R8 inter frequency relative accuracy of RSRP	12.5.0	12.6.0
2015-06	RAN#68	R5-151879	1145	1	Update test applicabilities for R9 inter frequency relative accuracy of RSRP	12.5.0	12.6.0
2015-06	RAN#68	R5-151880	1146	1	Update test applicabilities of R10 RSRP measurement accuracy	12.5.0	12.6.0
2015-06	RAN#68	R5-151882	1147	1	Update test applicabilities of R11 RSRP measurement accuracy	12.5.0	12.6.0
2015-06	RAN#68	R5-151883	1148	1	Update FDD CA RSRP Accuracy requirements	12.5.0	12.6.0
2015-06	RAN#68	R5-151904	1174	1	Correction to the titles of 2UL CA RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151905	1149	1	Correction of allowed CQI report delays in sCell Activation Tests	12.5.0	12.6.0
2015-06	RAN#68	R5-151906	1154	1	Correction to feICIC Radio link monitoring test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151915	1153	1	Correction to test case 9.2.10.1 of 36.521-3	12.5.0	12.6.0
2015-06	RAN#68	R5-151916	1175	1	Correction to FeICIC measurement performance test cases and Annex H.3	12.5.0	12.6.0
2015-06	RAN#68	R5-151917	1177	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test case 9.1.5.1	12.5.0	12.6.0
2015-06	RAN#68	R5-151918	1178	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test case 9.1.5.2	12.5.0	12.6.0
2015-06	RAN#68	R5-151923	1169	1	Addition of new RRM TC 8.16.23 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in FDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151924	1170	1	Addition of new RRM TC 8.16.24 E-UTRAN TDD-FDD CA Event Triggered Reporting Under Deactivated SCell in Non-DRX with PCell in TDD	12.5.0	12.6.0
2015-06	RAN#68	R5-151925	1173	1	Applicability for newly added TDD-FDD CA RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-151939	1152	1	Addition of FDD-TDD RSRP accuracy test cases for FDD-TDD CA.	12.5.0	12.6.0
2015-06	RAN#68	R5-152010	1151	1	Correction to RLM test in feICIC	12.5.0	12.6.0
2015-06	RAN#68	R5-152015	1126	2	Corrections to Derivation of Test Requirements for above 3GHz RRM test cases	12.5.0	12.6.0
2015-06	RAN#68	R5-152130	1110	1	CA RRM: Corrections to cell configuration mapping table	12.5.0	12.6.0
2015-06	RAN#68	R5-152131	1156	1	Correction to Event Triggered Reporting test in feICIC	12.5.0	12.6.0
2015-06	RAN#68	R5-152134	1157	2	Clarification of 2DL CA RRM inter-frequency tests with smaller channels bandwidth	12.5.0	12.6.0
2015-09	RAN#69	R5-153094	1183	-	Addition of cell configuration mapping for RRM test cases 8.16.17 and 8.16.18	12.6.0	12.7.0
2015-09	RAN#69	R5-153095	1184	-	Correction of cell configuration mapping for RRM cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153096	1185	-	Correction of RMC used in UE Timing Advance Adjustment Accuracy Test for SCell in sTAG	12.6.0	12.7.0
2015-09	RAN#69	R5-153164	1193	-	New TC: E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell for 20MHz + 10MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153167	1194	-	Cell configuration mapping for newly introduced 20+20MHz and 20+10MHz cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153176	1197	-	Addition of missing titles to section 8 RRM test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153177	1198	-	Update Test Tolerances and Test requirements for Test case 4.3.1.1	12.6.0	12.7.0
2015-09	RAN#69	R5-153179	1199	-	Update Test Tolerances and Test requirements for Test case 4.3.4.1	12.6.0	12.7.0
2015-09	RAN#69	R5-153181	1200	-	Update Test Tolerances and Test requirements for Test cases 5.1.3+5.1.4+5.1.7+5.1.8	12.6.0	12.7.0
2015-09	RAN#69	R5-153249	1204	-	CA RRM: Clarification of PHICH configuration	12.6.0	12.7.0
2015-09	RAN#69	R5-153250	1205	-	RRM: Minor correction to TC 8.7.2	12.6.0	12.7.0
2015-09	RAN#69	R5-153251	1206	-	Uncertainties and Test tolerances for TS 36.521-3 Test case 8.20.2B	12.6.0	12.7.0
2015-09	RAN#69	R5-153310	1209	-	Correction of L2G PSHO applicability for TS 36.521-3 spec	12.6.0	12.7.0
2015-09	RAN#69	R5-153357	1210	-	Correction to RLM tests for eICIC	12.6.0	12.7.0
2015-09	RAN#69	R5-153358	1211	-	Correction to initial conditions in event triggered reporting tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153359	1212	-	Correction to RSRP and RSRQ test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153387	1215	-	Correction to applicability of feICIC RRM test cases.	12.6.0	12.7.0
2015-09	RAN#69	R5-153461	1222	-	New TC: 8.20.2A for RRM	12.6.0	12.7.0

2015-09	RAN#69	R5-153471	1226	-	Update of test applicabilites for Rel-10 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153473	1227	-	Update of test applicabilites for Rel-11 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153475	1228	-	Update of Annex E for RRM 9.1.6.2_1 and 9.1.7.2_1	12.6.0	12.7.0
2015-09	RAN#69	R5-153532	1233	-	Update Uncertainties for Test case 5.2.7	12.6.0	12.7.0
2015-09	RAN#69	R5-153544	1234	-	Update Uncertainties for Test cases 5.2.8 and 5.2.9	12.6.0	12.7.0
2015-09	RAN#69	R5-153547	1235	-	Update Uncertainties for Test case 5.2.10	12.6.0	12.7.0
2015-09	RAN#69	R5-153553	1236	-	Correction to 8.16.17 and 8.16.18 activation and deactivation of known Scell	12.6.0	12.7.0
2015-09	RAN#69	R5-153687	1239	-	Uncerts and Test Tools for TCs 7.1.3+7.1.4 36.521-3 CR	12.6.0	12.7.0
2015-09	RAN#69	R5-153688	1240	-	Cell mapping for new RRM TCs 7.1.3_1+7.1.4_1	12.6.0	12.7.0
2015-09	RAN#69	R5-153812	1190	1	New TC: E-UTRAN TDD activation and deactivation of known SCell in non-DRX for 20MHz +20MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153814	1224	1	New TCs: FDD Rel-12 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153815	1225	1	New TCs: TDD Rel-12 CA RSRP relative accuracy tests	12.6.0	12.7.0
2015-09	RAN#69	R5-153816	1241	1	Addition of new RRM TCs 7.1.3_1+7.1.4_1	12.6.0	12.7.0
2015-09	RAN#69	R5-153818	1186	1	Correction of descriptions for test cases 8.16.18	12.6.0	12.7.0
2015-09	RAN#69	R5-153819	1187	1	Update editor's note for RRM test case 8.16.17 and 8.16.18	12.6.0	12.7.0
2015-09	RAN#69	R5-153829	1201	1	Introduction of 3DL CA Event triggered reporting Test cases 8.16.27 and 8.16.28	12.6.0	12.7.0
2015-09	RAN#69	R5-153830	1202	1	Introduction of 3DL CA RSRP accuracy Test cases 9.1.37 and 9.1.38	12.6.0	12.7.0
2015-09	RAN#69	R5-153831	1203	1	Introduction of 3DL Pcell in FDD RSRQ for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-153832	1207	1	Addition of new TC of 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-153833	1208	1	Addition of new TC of 3 DL FDD RSRQ for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-153834	1217	1	Updates to RRM TCs 8.16.23, 8.16.24, 8.16.25 and 8.16.26	12.6.0	12.7.0
2015-09	RAN#69	R5-153871	1229	1	New TCs: 9.1.40 and 9.1.40_1 TDD RSRP Accuracy for 3DL CA	12.6.0	12.7.0
2015-09	RAN#69	R5-153872	1230	1	New TCs: 9.2.39 TDD RSRQ Accuracy for 3DL CA	12.6.0	12.7.0
2015-09	RAN#69	R5-153898	1218	1	Addition of new TC 8.16.31 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in FDD	12.6.0	12.7.0
2015-09	RAN#69	R5-153899	1219	1	Addition of new TC 8.16.32 E-UTRAN TDD-FDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX and with PCell in TDD	12.6.0	12.7.0
2015-09	RAN#69	R5-153900	1220	1	Addition of new TC 8.16.33 E-UTRAN FDD 3DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	12.6.0	12.7.0
2015-09	RAN#69	R5-153901	1221	1	Addition of new TC 8.16.34 E-UTRAN TDD 3 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	12.6.0	12.7.0
2015-09	RAN#69	R5-153930	1188	1	New TC: E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +20 MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153931	1189	1	New TC: E-UTRAN TDD - UE Timing Advance Adjustment Accuracy Test for Scell in sTAG for 20 MHz +10 MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153934	1195	1	Correction to applicability of TD-LTE to UTRA TDD connected mode measurements	12.6.0	12.7.0
2015-09	RAN#69	R5-153936	1191	1	New TC: E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz + 20MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153937	1192	1	New TC: E-UTRAN TDD - UE Transmit Timing Accuracy Tests for SCell in sTAG for 20MHz + 10MHz bandwidth	12.6.0	12.7.0
2015-09	RAN#69	R5-153938	1196	1	Correction to cell mapping of eICIC Chapter 9 test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-153939	1213	1	Clarification of neighbour cell frequency for intra-band non-contiguous CA	12.6.0	12.7.0
2015-09	RAN#69	R5-153940	1223	1	Update of minimum requirements for relative RSRP Accuracy TC 9.1.6.2 and 9.1.7.2	12.6.0	12.7.0
2015-09	RAN#69	R5-153943	1238	1	Introduction of new 3DL CA Test cases 8.16.30	12.6.0	12.7.0
2015-09	RAN#69	R5-154000	1179	1	Introduction of TC 8.16.38 3DL TDD CA activation and deactivation of known SCell in non-DRX	12.6.0	12.7.0
2015-09	RAN#69	R5-154001	1182	1	Introduction of 3 DL TDD Absolute/Relative RSRQ for E-UTRAN in Carrier Aggregation	12.6.0	12.7.0
2015-09	RAN#69	R5-154028	1214	1	Update of Annex E for 3DL CA RRM	12.6.0	12.7.0
2015-09	RAN#69	R5-154029	1237	2	Introduction of new 3DL CA Test cases 8.16.29	12.6.0	12.7.0
2015-09	RAN#69	R5-154033	1242	1	Correction to relative measurement test cases of feICIC RRM test cases	12.6.0	12.7.0
2015-09	RAN#69	R5-154049	1243	-	CA RRM: Additions to cell mapping Table E-1	12.6.0	12.7.0

2015-09	RAN#69	R5-154058	1244	-	eICIC RRM: Corrections to cell mapping Table E-1	12.6.0	12.7.0
2015-12	RAN#70	R5-155108	1258	-	Correction to test procedure of inter-frequency autonomous gaps test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155134	1262	-	Updating Annex E and F with newly introduced test cases for MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155135	1263	-	Adding RMCs for MTC to Annex A	12.7.0	12.8.0
2015-12	RAN#70	R5-155136	1264	-	Adding abbreviations and SS HD-FDD testing information	12.7.0	12.8.0
2015-12	RAN#70	R5-155139	1266	-	Uncertainties and Test tolerances for Test cases 4.3.2 and 4.3.4.2	12.7.0	12.8.0
2015-12	RAN#70	R5-155141	1267	-	Uncertainties and Test tolerances for Test cases 4.4.1 and 4.4.2	12.7.0	12.8.0
2015-12	RAN#70	R5-155143	1268	-	Uncertainties and Test tolerances for Test cases 4.5.1.1 and 4.5.2.1	12.7.0	12.8.0
2015-12	RAN#70	R5-155145	1269	-	Uncertainties and Test tolerances for Test case 8.20.2A	12.7.0	12.8.0
2015-12	RAN#70	R5-155147	1270	-	Uncertainties and Test tolerances for Test case 8.20.4A	12.7.0	12.8.0
2015-12	RAN#70	R5-155149	1271	-	Uncertainties and Test tolerances for Test case 8.20.4B	12.7.0	12.8.0
2015-12	RAN#70	R5-155197	1286	-	Uncertainties and Test Tolerance for E-UTRAN TDD – UE Timing Advanced Adjustment Accuracy Test for SCell in sTAG	12.7.0	12.8.0
2015-12	RAN#70	R5-155270	1297	-	Correction to test case 7.1.2	12.7.0	12.8.0
2015-12	RAN#70	R5-155399	1304	-	Addition of cell configuration mapping for newly introduced MTC tests	12.7.0	12.8.0
2015-12	RAN#70	R5-155427	1305	-	Uncertainties and Test Tolerances for 3DL FDD RSRP for E-UTRAN in Carrier Aggregation	12.7.0	12.8.0
2015-12	RAN#70	R5-155429	1307	-	Update to 3DL PCell in FDD RSRQ for E-UTRAN in Carrier Aggregation	12.7.0	12.8.0
2015-12	RAN#70	R5-155437	1310	-	Removable of wait time after activation of Scell	12.7.0	12.8.0
2015-12	RAN#70	R5-155574	1319	-	Incorrect Io values for eICIC tests	12.7.0	12.8.0
2015-12	RAN#70	R5-155680	1328	-	Adding new RRM test case 8.16.35 for 3DL CA	12.7.0	12.8.0
2015-12	RAN#70	R5-155681	1329	-	Adding new RRM test case 8.16.36 for 3DL CA	12.7.0	12.8.0
2015-12	RAN#70	R5-155770	1330	-	Introduction of test case 9.1.41.1 - FD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155771	1331	-	Introduction of test case 9.1.41.2 - FD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155772	1332	-	Introduction of test case 9.1.42.1 - HD-FDD Intra Frequency Absolute RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155773	1333	-	Introduction of test case 9.1.42.2 - HD-FDD Intra Frequency Relative RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155774	1334	-	Introduction of test case 9.1.43.1 - TDD Intra Frequency Absolute RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155775	1335	-	Introduction of test case 9.1.43.2 - TDD Intra Frequency Relative RSRP Accuracy for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155776	1336	-	Introduction of cell configuration mapping for Intra Frequency RSRP Accuracy for UE category 0 Test Cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155805	1256	1	Update minimum requirements for test case 8.1.1	12.7.0	12.8.0
2015-12	RAN#70	R5-155806	1265	1	Updating and aligning of RMC tables in TS36.521-3	12.7.0	12.8.0
2015-12	RAN#70	R5-155820	1250	1	Introduction of new test case 6.1.8 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155821	1252	1	Introduction of new test case 8.1.12 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155822	1253	1	Introduction of new test case 8.1.13 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155823	1254	1	Introduction of new test case 8.1.17 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155824	1255	1	Introduction of new test case 8.1.18 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-155825	1259	1	Adding new MTC handover test case 5.1.10	12.7.0	12.8.0
2015-12	RAN#70	R5-155826	1260	1	Adding new MTC handover test case 5.1.11	12.7.0	12.8.0
2015-12	RAN#70	R5-155827	1261	1	Adding new MTC handover test case 5.1.12	12.7.0	12.8.0
2015-12	RAN#70	R5-155828	1272	1	Adding new MTC FD-FDD RLM test case for out-of-sync and definition update	12.7.0	12.8.0
2015-12	RAN#70	R5-155829	1273	1	Adding new MTC FD-FDD RLM test case for in-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155830	1274	1	Adding new MTC FD-FDD RLM test case for out-of-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155831	1275	1	Adding new MTC FD-FDD RLM test case for in-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155832	1276	1	Adding new MTC HD-FDD RLM test case for out-of-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155833	1277	1	Adding new MTC HD-FDD RLM test case for in-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155834	1278	1	Adding new MTC HD-FDD RLM test case for out-of-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155835	1279	1	Adding new MTC HD-FDD RLM test case for in-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155836	1280	1	Adding new MTC TDD RLM test case for out-of-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155837	1281	1	Adding new MTC TDD RLM test case for in-sync	12.7.0	12.8.0
2015-12	RAN#70	R5-155838	1282	1	Adding new MTC TDD RLM test case for out-of-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155839	1283	1	Adding new MTC TDD RLM test case for in-sync in DRX	12.7.0	12.8.0
2015-12	RAN#70	R5-155862	1284	1	Update to RSRP accuracy test cases for FDD-TDD CA	12.7.0	12.8.0

2015-12	RAN#70	R5-155863	1299	1	Update of message contents for 3DL CA RSRP and RSRQ Accuracy tests	12.7.0	12.8.0
2015-12	RAN#70	R5-155864	1309	1	Correction to test applicability in 3DL CA RRM test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155866	1315	1	Clarification on frequency swapping and references to connection diagrams in 3DL CA RRM test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155867	1316	1	Addition of missing applicability release to test case 9.2.39	12.7.0	12.8.0
2015-12	RAN#70	R5-155868	1320	1	Introduction of new 3DL CA RRM test case TC 8.16.41 "3 DL FDD CA activation and deactivation of unknown SCell in non-DRX"	12.7.0	12.8.0
2015-12	RAN#70	R5-155869	1327	1	Updating 3DL CA test cases 8.16.29 and 8.16.30	12.7.0	12.8.0
2015-12	RAN#70	R5-155878	1288	1	Uncertainties and Test Tolerances for 3DL CA Event Triggered Reporting under Deactivated SCells in Non-DRX Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155879	1290	1	Uncertainties and Test Tolerances for 3DL E-UTRA for Carrier Aggregation RSRQ Accuracy Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155880	1321	1	Uncerts and Test Tools for TCs 8.16.31+8.16.32+8.16.33+8.16.34 36.521-3 CR	12.7.0	12.8.0
2015-12	RAN#70	R5-155881	1257	1	Updated to TC 7.1.4A	12.7.0	12.8.0
2015-12	RAN#70	R5-155888	1285	1	Update RSRQ and reported values for serving cell Intra Frequency Absolute RSRQ Accuracy Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155889	1287	1	Uncertainties and Test Tolerances for 2DL CA activation and deactivation of known SCell in non-DRX Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-155896	1293	1	Add new LC MTC test case 8.1.19 E-UTRAN FD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155897	1294	1	Add new LC MTC test case 8.1.20 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0.	12.7.0	12.8.0
2015-12	RAN#70	R5-155898	1295	1	Add new LC MTC test case 8.1.21 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-155899	1296	1	Add new LC MTC test case 8.1.22 E-UTRAN HD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-156009	1298	1	Update Test applicability for test case 7.1.7 and 7.2.5	12.7.0	12.8.0
2015-12	RAN#70	R5-156015	1326	1	Addition of UE transmit timing accuracy test case for PRoSe Direct discovery.	12.7.0	12.8.0
2015-12	RAN#70	R5-156032	1289	1	Uncertainties and Test Tolerances for 3DL E-UTRA for Carrier Aggregation RSRP Accuracy Test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-156033	1308	1	Update of Annex E for 3DL CA RRM	12.7.0	12.8.0
2015-12	RAN#70	R5-156034	1311	1	Correction to 3DL CA RSRP/RSRQ test cases	12.7.0	12.8.0
2015-12	RAN#70	R5-156051	1251	1	Introduction of new test case 8.1.11 MTC	12.7.0	12.8.0
2015-12	RAN#70	R5-156053	1291	1	Add new LC MTC test case 6.1.6 E-UTRAN FD-FDD Intra-frequency RRC Re-establishment for UE category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-156054	1292	1	Add new LC MTC test case 6.1.7 E-UTRAN HD-FDD Intra-frequency RRC Re-establishment for UE category 0category 0	12.7.0	12.8.0
2015-12	RAN#70	R5-156067	1322	1	Addition of new SCE-L1 RRM TC 8.22.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156068	1323	1	Addition of new SCE-L1 RRM TC 8.22.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156069	1324	1	Addition of new SCE-L1 RRM TC 8.22.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156070	1325	1	Addition of new SCE-L1 RRM TC 8.22.4 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in DRX based on CRS based discovery signal	12.7.0	12.8.0
2015-12	RAN#70	R5-156128	1313	1	Correction to message contents for RRM 3DL CA TC 9.2.41	12.7.0	12.8.0
2015-12	RAN#70	R5-156129	1314	1	Corrections to message contents for RRM 3DL CA TCs 8.16.27+8.16.28	12.7.0	12.8.0
2015-12	RAN#70	R5-156137	1301	2	Update of test applicabilities for R12 RRM cases in 36.521-3	12.7.0	12.8.0
2016-03	RAN#71	R5-160121	1346	-	Updates and Test Tolerances for 2DL FDD-TDD E-UTRA for Carrier Aggregation RSRP Accuracy Test cases	12.8.0	12.9.0
2016-03	RAN#71	R5-160191	1349	-	Updates and Test Tolerances for 2DL E-UTRA for Carrier Aggregation RSRQ Accuracy Test cases	12.8.0	12.9.0

2016-03	RAN#71	R5-160200	1350	-	Band 66 update of 3DL E-UTRA for CA RSRP Accuracy Test cases	12.8.0	12.9.0
2016-03	RAN#71	R5-160204	1351	-	Correction to test case 8.20.2B	12.8.0	12.9.0
2016-03	RAN#71	R5-160207	1353	-	Correction to test case 8.16.17 and 8.16.18	12.8.0	12.9.0
2016-03	RAN#71	R5-160221	1356	-	Uncertainties and TT for 8.16.23 and 8.16.24 TDD-FDD CA event triggered reporting under deactivated SCell in non-DRX with PCell in FDD/TDD 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160222	1357	-	Uncertainties and TT for 8.16.25 and 8.16.26 TDD-FDD CA event triggered reporting on deactivated SCell with PCell interruption in non-DRX with PCell in FDD/TDD 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160237	1358	-	Condition definitions for discovery measurements and measurement accuracy requirements	12.8.0	12.9.0
2016-03	RAN#71	R5-160257	1363	-	Addition of new SCE-L1 RRM TC 8.22.9 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160258	1364	-	Addition of new SCE-L1 RRM TC 8.22.10 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160261	1367	-	Addition of new SCE-L1 RRM TC 9.1.25 FDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160262	1368	-	Addition of new SCE-L1 RRM TC 9.1.26 TDD intra-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160263	1369	-	Addition of new SCE-L1 RRM TC 9.1.27 FDD—FDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160264	1370	-	Addition of new SCE-L1 RRM TC 9.1.28 TDD—TDD inter-frequency absolute and relative RSRP accuracies in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160265	1371	-	Addition of new SCE-L1 RRM TC 9.1.33 FDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160266	1372	-	Addition of new SCE-L1 RRM TC 9.1.34 TDD absolute and relative RSRP accuracies for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160267	1373	-	Addition of new SCE-L1 RRM TC 9.2.28 FDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160268	1374	-	Addition of new SCE-L1 RRM TC 9.2.29 TDD intra-frequency absolute RSRQ accuracy with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160269	1375	-	Addition of new SCE-L1 RRM TC 9.2.30 FDD-FDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160270	1376	-	Addition of new SCE-L1 RRM TC 9.2.31 TDD-TDD inter-frequency absolute and relative RSRQ accuracies with CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160271	1377	-	Addition of new SCE-L1 RRM TC 9.2.32 FDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160272	1378	-	Addition of new SCE-L1 RRM TC 9.2.33 TDD absolute and relative RSRQ accuracy for E-UTRAN Carrier Aggregation in CRS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160443	1382	-	Introduction of new Dual Connectivity test case 8.23.1	12.8.0	12.9.0
2016-03	RAN#71	R5-160444	1383	-	Introduction of new Dual Connectivity test case 8.23.2	12.8.0	12.9.0
2016-03	RAN#71	R5-160445	1384	-	Introduction of new Dual Connectivity test case 8.23.3	12.8.0	12.9.0
2016-03	RAN#71	R5-160446	1385	-	Introduction of new Dual Connectivity test case 8.23.4	12.8.0	12.9.0
2016-03	RAN#71	R5-160447	1386	-	Introduction of new Dual Connectivity test case 8.23.5	12.8.0	12.9.0
2016-03	RAN#71	R5-160448	1387	-	Introduction of new Dual Connectivity test case 8.23.6	12.8.0	12.9.0
2016-03	RAN#71	R5-160450	1389	-	Update to MTC test cases 8.1.11, 8.1.12, 8.1.13, 8.1.17, 8.1.18	12.8.0	12.9.0
2016-03	RAN#71	R5-160452	1391	-	Update to test cases 8.16.17	12.8.0	12.9.0
2016-03	RAN#71	R5-160497	1397	-	Correction to event triggered tests without measurement gaps	12.8.0	12.9.0
2016-03	RAN#71	R5-160498	1398	-	Correction to RLM tests in feICIC	12.8.0	12.9.0
2016-03	RAN#71	R5-160556	1405	-	CA RRM: Inconsistent message contents in 3CC event triggered tests	12.8.0	12.9.0
2016-03	RAN#71	R5-160558	1407	-	CA RRM: Missing message contents in 3CC TCs 9.1.37 and 9.1.38	12.8.0	12.9.0
2016-03	RAN#71	R5-160559	1408	-	RRM: Correction of applicability of TCs 9.3.2 and 9.4.2	12.8.0	12.9.0
2016-03	RAN#71	R5-160572	1409	-	Updating TS36.521-3 clause 3.5.1 for band 66	12.8.0	12.9.0
2016-03	RAN#71	R5-160574	1410	-	Updating Annex I with band group FDD_B	12.8.0	12.9.0

2016-03	RAN#71	R5-160610	1416	-	Antenna configuration principle for 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160702	1417	-	Introducing DC RRM test case 7.3.38	12.8.0	12.9.0
2016-03	RAN#71	R5-160703	1418	-	Introducing DC RRM test case 7.3.39	12.8.0	12.9.0
2016-03	RAN#71	R5-160704	1419	-	Introducing DC RRM test case 7.3.40	12.8.0	12.9.0
2016-03	RAN#71	R5-160705	1420	-	Updating References, Definitions and Abbreviations for DC in 36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160821	1361	1	Addition of new SCE-L1 RRM TC 8.22.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160822	1362	1	Addition of new SCE-L1 RRM TC 8.22.8 E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation condition in DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160823	1365	1	Addition of new SCE-L1 RRM TC 8.22.11 E-UTRAN FDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160824	1366	1	Addition of new SCE-L1 RRM TC 8.22.12 E-UTRAN TDD event triggered reporting under deactivated SCell in non-DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-160833	1406	1	CA RRM: Ambiguous description of relative RSRQ measurements in 3CC tests	12.8.0	12.9.0
2016-03	RAN#71	R5-160834	1395	1	Correction to test frequency configuration for 3DL CA RRM	12.8.0	12.9.0
2016-03	RAN#71	R5-160847	1352	1	Correction to test case 7.1.4 and 7.1.4_1	12.8.0	12.9.0
2016-03	RAN#71	R5-160872	1402	1	Updating Annex F for E-UTRAN 3DL CA Activation and Deactivation of Known SCell in Non-DRX test cases in TS36.521-3	12.8.0	12.9.0
2016-03	RAN#71	R5-160876	1388	1	Uncertainties and Test Tolerances for E-UTRAN UE Transmit Timing Accuracy Tests for SCell in sTAG in FDD/TDD Test cases	12.8.0	12.9.0
2016-03	RAN#71	R5-160883	1390	1	Update to RRM test cases 7.1.3, 7.1.3_1, 7.1.4, 7.1.4_1, 7.1.4A for TT and Uncerts	12.8.0	12.9.0
2016-03	RAN#71	R5-160884	1414	1	Update of HO testcases for MTC	12.8.0	12.9.0
2016-03	RAN#71	R5-160886	1339	2	Introduction of TC 8.1.15 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for UE category 0MTC	12.8.0	12.9.0
2016-03	RAN#71	R5-160887	1338	2	Add new LC MTC test case 8.1.14 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160888	1340	2	Introduction of TC 8.1.16 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160889	1341	2	Introduction of TC 8.2.7 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160890	1342	2	Introduction of TC 8.2.8 E-UTRAN TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160891	1343	2	Introduction of TC 9.2.42.1 FD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160892	1344	2	Introduction of TC 9.2.43.1 HD-FDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160893	1345	2	Introduction of TC 9.2.44.1 TDD Intra Frequency Absolute RSRQ Accuracy for UE category 0	12.8.0	12.9.0
2016-03	RAN#71	R5-160894	1415	1	Update of RLM testcases for MTC	12.8.0	12.9.0
2016-03	RAN#71	R5-161002	1394	1	Correction to RRC message exceptions for 3DL CA RSRP/RSRQ	12.8.0	12.9.0
2016-03	RAN#71	R5-161007	1403	1	Addition of test cases for transmission timing accuracy and Interruptions for D2D	12.8.0	12.9.0
2016-03	RAN#71	R5-161037	1359	1	Addition of new RRM TC 8.22.5 E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX based on CSI-RS based discovery signal	12.8.0	12.9.0
2016-03	RAN#71	R5-161038	1360	1	Addition of new RRM TC 8.22.7 E-UTRAN FDD-FDD inter-frequency event triggered reporting for DRS measurement based on CSI-RS with DRX	12.8.0	12.9.0
2016-03	RAN#71	R5-161051	1411	1	Correcting the applicability of test cases 9.5.1 and 9.5.2	12.8.0	12.9.0
2016-03	RAN#71	R5-161068	1392	1	Update to test cases 8.16.17A and 8.16.18A	12.8.0	12.9.0
2016-03	RAN#71	R5-161094	1393	2	Correction to Event Triggered Reporting test under Deactivated SCells	12.8.0	12.9.0
2016-03	RAN#71	R5-161095	1396	2	Correction to 3DL CA with deactivated SCell with PCell and SCell interruptions	12.8.0	12.9.0
2016-03	RAN#71	R5-161096	1400	1	Updating RRM test case 8.16.35	12.8.0	12.9.0

2016-03	RAN#71	R5-161097	1401	2	Updating RRM test case 8.16.36	12.8.0	12.9.0
2016-03	RAN#71	R5-161098	1354	2	New TC 8.16.39 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in FDD	12.8.0	12.9.0
2016-03	RAN#71	R5-161099	1355	2	New TC 8.16.40 E-UTRA TDD-FDD 3DL CA Activation and Deactivation of Unknown SCell in Non-DRX with PCell in TDD	12.8.0	12.9.0
2016-03	RAN#71	R5-161100	1380	2	Addition of new test case for 3DL FDD CA activation and deactivation of known cell	12.8.0	12.9.0
2016-03	RAN#71	R5-161106	1347	2	Test Tolerances for TC 8.16.38 3DL TDD CA activation and deactivation of known SCell in non-DRX	12.8.0	12.9.0
2016-03	RAN#71	R5-161117	1379	2	Updates of FDD 2DL CA activation and deactivation test case	12.8.0	12.9.0
2016-03	RAN#71	R5-161118	1399	2	Correction to 9.1.15.1 and 9.1.15.2 RSRP tests for feICIC	12.8.0	12.9.0
2016-03	RAN#71	R5-161122	1413	3	Correction of test procedure for 3DL CA RRM test case TC 8.16.41 “3 DL FDD CA activation and deactivation of unknown SCell in non-DRX”	12.8.0	12.9.0
2016-03	RAN#71	R5-161123	1412	3	Introduction of new 3DL CA RRM test case TC 8.16.42 “3 DL TDD CA activation and deactivation of unknown SCell in non-DRX”	12.8.0	12.9.0
2016-06	RAN#72	R5-162186	1422	-	Editorial correction uplink absolute power measurement in Annex F.1.2	12.9.0	12.10.0
2016-06	RAN#72	R5-162190	1423	-	Update of test tolerance for UE ProSe discovery transmission timing	12.9.0	12.10.0
2016-06	RAN#72	R5-162193	1424	-	Update of Test Tolerance analyses for 7.5.1	12.9.0	12.10.0
2016-06	RAN#72	R5-162278	1425	-	Correction to Table number for using MAC-MainConfig-RBC message	12.9.0	12.10.0
2016-06	RAN#72	R5-162286	1430	-	Update of RRM RLM test cases for Cat 0	12.9.0	12.10.0
2016-06	RAN#72	R5-162288	1431	-	Update of Annex F for Cat 0 RLM test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162310	1432	-	RRM: Correction to TCs 7.1.7A and 7.1.7B	12.9.0	12.10.0
2016-06	RAN#72	R5-162311	1433	-	RRM: Corrections to ri-ConfigIndex in 3CC test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162312	1434	-	RRM: Missing release applicability of inter-mode 3CC test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162313	1435	-	RRM: Clarification of message content in TC 8.16.36	12.9.0	12.10.0
2016-06	RAN#72	R5-162321	1437	-	Addition of test cases for SLSS initiation and cease	12.9.0	12.10.0
2016-06	RAN#72	R5-162330	1439	-	Introduction of TDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162334	1442	-	Correction of 3DL CA RRM test case 8.16.36	12.9.0	12.10.0
2016-06	RAN#72	R5-162336	1443	-	Introduction of TDD-TDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162397	1447	-	Uncertainties and Test tolerances for TS 36.521-3 Test cases 9.1.6.1_1 and 9.1.12.1_1	12.9.0	12.10.0
2016-06	RAN#72	R5-162399	1448	-	Uncertainties and Test tolerances for TS 36.521-3 Test cases 9.1.6.2_1 and 9.1.12.2_1	12.9.0	12.10.0
2016-06	RAN#72	R5-162430	1450	-	Update of RRM test cases 9.1.1.1, 9.1.2.1, 9.1.16.1 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162433	1451	-	Update of RRM test cases 9.1.1.1_1, 9.1.2.1_1, 9.1.16.1_1 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162436	1452	-	Update of RRM test cases 9.1.1.2, 9.1.2.2, 9.1.16.2 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162439	1453	-	Update of RRM test cases 9.1.3.1, 9.1.4.1, 9.1.17.1 to include band 65, 66	12.9.0	12.10.0
2016-06	RAN#72	R5-162600	1461	-	Correction to test applicability in 3DL CA activation and deactivation TCs	12.9.0	12.10.0
2016-06	RAN#72	R5-162830	1463	1	Correction to 3DL CA activation and deactivation TCs	12.9.0	12.10.0
2016-06	RAN#72	R5-162831	1454	1	Correction to applicability for EUTRA TDD to UTRA TDD Son test case	12.9.0	12.10.0
2016-06	RAN#72	R5-162833	1438	1	Introduction of FDD intra frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162834	1441	1	Introduction of FDD-FDD inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162835	1444	1	Introduction of FDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162836	1445	1	Introduction of TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	12.9.0	12.10.0
2016-06	RAN#72	R5-162881	1436	1	Addition of ProSe cell selection test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162891	1421	1	Uncertainties and Test Tolerances for MTC RRM TC 8.1.11, 8.1.12, 8.1.13, 8.1.17 and 8.1.18	12.9.0	12.10.0
2016-06	RAN#72	R5-162894	1429	1	Test Tolerance updates for MTC test cases in clause 6	12.9.0	12.10.0

2016-06	RAN#72	R5-162895	1457	1	Add Test requirements for TS 36.521-3 Test case 8.22.1 and 8.22.2	12.9.0	12.10.0
2016-06	RAN#72	R5-162897	1458	1	Add Test requirements for TS 36.521-3 Test case 8.22.3 and 8.22.4	12.9.0	12.10.0
2016-06	RAN#72	R5-162957	1426	1	Update to Dual Connectivity RRM test case 8.23.4	12.9.0	12.10.0
2016-06	RAN#72	R5-162958	1427	1	Update to Dual Connectivity RRM test case 8.23.5	12.9.0	12.10.0
2016-06	RAN#72	R5-162959	1428	1	Update to Dual Connectivity RRM test case 8.23.6	12.9.0	12.10.0
2016-06	RAN#72	R5-162960	1446	1	Added new clause for Synchronous and Asynchronous DC test principles	12.9.0	12.10.0
2016-06	RAN#72	R5-162961	1456	1	Update to Dual Connectivity RRM test case 8.23.2	12.9.0	12.10.0
2016-06	RAN#72	R5-162962	1467	1	Update to Dual Connectivity RRM test case 8.23.3	12.9.0	12.10.0
2016-06	RAN#72	R5-162963	1468	1	Update of DC RLM test cases	12.9.0	12.10.0
2016-06	RAN#72	R5-162964	1469	1	Adding new RLM test case 7.3.41	12.9.0	12.10.0
2016-06	RAN#72	R5-162965	1470	1	Adding new RLM test case 7.3.42	12.9.0	12.10.0
2016-06	RAN#72	R5-162966	1471	1	Adding new RLM test case 7.3.43	12.9.0	12.10.0
2016-06	RAN#72	R5-163111	1455	1	Update to Dual Connectivity RRM test case 8.23.1	12.9.0	12.10.0
2016-06	RAN#72	R5-163128	1459	1	Add Test requirements for TS 36.521-3 Test case 9.1.25 and 9.1.26	12.9.0	12.10.0
2016-06	RAN#72	R5-163197	1462	2	Correction to duration of T3 in 3 DL CA Event Triggered Reporting on Deactivated Scell	12.9.0	12.10.0
2016-06	RAN#72	R5-163134	1464	1	Clean up on RRM test cases in chapter 7, 8, 9	12.9.0	12.10.0
2016-06	RAN#72	R5-163135	1465	1	Correction to event triggered reporting under deactivated SCell(10MHz+5MHz and 20MHz+10MHz)	12.9.0	12.10.0
2016-09	RAN#73	R5-165130	1472	-	Parameter correction for TC 9.2.16.1	12.10.0	12.11.0
2016-09	RAN#73	R5-165166	1477	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.3.1_1 and 9.1.4.1_1	12.10.0	12.11.0
2016-09	RAN#73	R5-165168	1478	-	Update Test Tolerances and Test requirements for TS 36.521-3 Test cases 9.1.3.2_1 and 9.1.4.2_1	12.10.0	12.11.0
2016-09	RAN#73	R5-165296	1482	-	Band 66 update of Inter-freq relative RSRP accuracy Test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165389	1490	-	Update of test tolerance for UE ProSe direct communication transmission timing	12.10.0	12.11.0
2016-09	RAN#73	R5-165428	1494	-	Modification of measurement report configuration for TC 8.1.8 and 8.2.6	12.10.0	12.11.0
2016-09	RAN#73	R5-165527	1496	-	Add Test requirements for TS 36.521-3 Test case 8.22.9 and 8.22.10	12.10.0	12.11.0
2016-09	RAN#73	R5-165528	1497	-	Add Test requirements for TS 36.521-3 Test case 9.2.28 and 9.2.29	12.10.0	12.11.0
2016-09	RAN#73	R5-165529	1498	-	Add Test requirements for TS 36.521-3 Test case 9.2.30 and 9.2.31	12.10.0	12.11.0
2016-09	RAN#73	R5-165530	1499	-	Add Test requirements for TS 36.521-3 Test case 9.2.32 and 9.2.33	12.10.0	12.11.0
2016-09	RAN#73	R5-165577	1507	-	Update Annex F for TS 36.521-3 Test case 9.1.27, 9.1.28, 9.1.33 and 9.1.34	12.10.0	12.11.0
2016-09	RAN#73	R5-165643	1511	-	Correction to applicability for TDD-UTRAN TDD SON	12.10.0	12.11.0
2016-09	RAN#73	R5-165664	1513	-	Correction to test parameters of 3DL CA event triggered report test cases for 8.16.31, 8.16.32, 8.16.33 and 8.16.34	12.10.0	12.11.0
2016-09	RAN#73	R5-165665	1514	-	Clarification of test parameters for RRM asymmetric bandwidth 2CA test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165666	1515	-	Clarification of test applicability for 2DL CA with intra-band non-contiguous	12.10.0	12.11.0
2016-09	RAN#73	R5-165667	1516	-	Clean up on CA RRM test cases 8.16.25 and 9.1.40_1	12.10.0	12.11.0
2016-09	RAN#73	R5-165668	1517	-	Update of cell configuration mappings for FDD/TDD 3CA band combination	12.10.0	12.11.0
2016-09	RAN#73	R5-165669	1518	-	Correction to the test applicability for test cases 8.20.4, 8.20.4A and 8.20.4B	12.10.0	12.11.0
2016-09	RAN#73	R5-165670	1519	-	Clean up on RRM test cases 8.7.2 and 8.11.4	12.10.0	12.11.0
2016-09	RAN#73	R5-165851	1537	-	Removing redundant Editor's note from Clause 9 in 36.521-3	12.10.0	12.11.0
2016-09	RAN#73	R5-165852	1538	-	Adding antenna connection diagram references to RRM DC RLM test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165853	1539	-	Updating Annex E with DC RLM test cases 7.3.38 – 7.3.43	12.10.0	12.11.0
2016-09	RAN#73	R5-165861	1540	-	Update of definitions for IncMon	12.10.0	12.11.0
2016-09	RAN#73	R5-166024	1500	1	Correction of triggering event for SCE test case 8.22.5 and 8.22.6	12.10.0	12.11.0
2016-09	RAN#73	R5-166025	1501	1	Introduce Cell configuration mapping for SCE RRM test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-166098	1484	1	Update of test tolerance for UE ProSe direct communication SLSS initiation and cease	12.10.0	12.11.0
2016-09	RAN#73	R5-166100	1512	1	Correction to 3DL CA Activation and Deactivation test cases	12.10.0	12.11.0
2016-09	RAN#73	R5-165575	1505	-	Update Test requirement for TS 36.521-3 Test case 9.1.27and 9.1.28	12.10.0	12.11.0

2016-09	RAN#73	R5-165576	1506	-	Update Test requirement for TS 36.521-3 Test case 9.1.33 and 9.1.34	12.10.0	12.11.0
2016-09	RAN#73	R5-166305	1536	1	Adding CQI reporting periodicity to MTC test cases	12.10.0	12.11.0
2016-09	RAN3#73	R5-166306	1492	1	Uncertainties and Test Tolerances for intra frequency absolute and relative CSI-RSRP accuracies in CRI-RS based discovery signal Aggregation	12.10.0	12.11.0
2016-09	RAN#73	R5-166308	1527	1	Add note to cell mapping table in Annex E for band 66 high range testing	12.10.0	12.11.0
2016-09	RAN#73	R5-165385	1488	-	Introduction of FD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-165388	1489	-	Introduction of HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-165390	1491	-	Introduction of TDD RSRP Intra frequency case for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-165505	1495	-	Introduction of Band 45 into 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5=165570	1502	-	Update Test requirement for TS 36.521-3 Test case 6.2.7 and 6.2.8	12.11.0	13.0.0
2016-09	RAN#73	R5-165571	1503	-	Update Test requirement for TS 36.521-3 Test case 7.2.4	12.11.0	13.0.0
2016-09	RAN#73	R5-165572	1504	-	Update Annex F for TS 36.521-3 Test case 6.2.7, 6.2.8 and 7.2.4	12.11.0	13.0.0
2016-09	RAN#73	R5-165739	1520	-	Correction to Band 66 notes in E-UTRA band groups in 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165836	1528	-	Adding new eMTC test case 6.1.9 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165839	1529	-	Adding new eMTC test case 6.1.10 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165840	1530	-	Adding new eMTC test case 6.1.11 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165841	1531	-	Adding new eMTC test case 7.1.10 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165842	1532	-	Adding new eMTC test case 7.1.11 to 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165844	1533	-	Adding new eMTC RRM test cases to Annex E of 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-165845	1534	-	Adding new eMTC RMCs to Annex A of 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-166089	1485	1	Introduction of E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-166090	1487	1	Introduction of E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	12.11.0	13.0.0
2016-09	RAN#73	R5-166163	1474	1	Introduction of eMTC RRM TC 4.2.12	12.11.0	13.0.0
2016-09	RAN#73	R5-166164	1475	1	Introduction of eMTC RRM TC 4.2.13	12.11.0	13.0.0
2016-09	RAN#73	R5-166167	1486	1	Introduction of E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	12.11.0	13.0.0
2016-09	RAN#73	R5-166182	1543	1	Addition of RLM test cases for FD-FDD CE Mode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166175	1523	1	New Test Case: 7.3.50: E-UTRAN FD-FDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166176	1524	1	New test case: 7.3.51: E-UTRAN FD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 Configured in CEMode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166178	1526	1	New test case: 7.3.55: E-UTRAN HD-FDD Radio Link Monitoring Test for In-sync in DRX for UE Category M1 configured in CEMode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166183	1544	1	Addition of RLM test cases for HD-FDD CE Mode A	12.11.0	13.0.0
2016-09	RAN#73	R5-166316	1521	2	New Test Case: 6.2.10: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	12.11.0	13.0.0
2016-09	RAN#73	R5-166317	1522	2	New Test Case: 6.2.11: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Normal Coverage	12.11.0	13.0.0
2016-09	RAN#73	R5-166318	1535	1	Adding new OCNG pattern definitions for eMTC to Annex D of 36.521-3	12.11.0	13.0.0
2016-09	RAN#73	R5-166333	1525	2	New Test Case: 7.3.54: E-UTRAN HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE Category M1 Configured in CEMode A	12.1.00	13.0.0
2016-12	RAN#74	R5-168061	1546	F	New Reference Channel for TS 37.571-1 RSTD tests	13.0.0	13.1.0
2016-12	RAN#74	R5-168131	1547	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync for Cat-M1 UE in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-168132	1548	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for In-sync for Cat-M1 UE in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-168133	1549	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for Out-of-Sync in DRX for UE Category M1 Configured in CEMode A	13.0.0	13.1.0

2016-12	RAN#74	R5-168134	1550	F	Addition of new test case E-UTRAN TDD Radio Link Monitoring Test for In-Sync in DRX for UE Category M1 Configured in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-168156	1551	F	Introduction of new definitions for NB-IoT in Chapter 3	13.0.0	13.1.0
2016-12	RAN#74	R5-168157	1552	F	Introduction of Reference NPRACH Configurations for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-168158	1553	F	Introduction of OCNG pattern for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-168159	1554	F	Correction of NPDCCH RMC for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-168170	1558	F	Uncertainties and Test Tolerances for inter frequency absolute and relative CSI-RSRP accuracies in CSI-RS based discovery signal	13.0.0	13.1.0
2016-12	RAN#74	R5-168172	1559	F	Uncertainties and Test Tolerances for FDD/TDD absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal	13.0.0	13.1.0
2016-12	RAN#74	R5-168179	1565	F	Uncertainties and Test Tolerances for intra frequency absolute and relative RSRP accuracies of Cat-M1 UE in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168185	1568	F	Introduction of HD-FDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-168197	1569	F	Updating Annex F by adding clause 6 test cases for eMTC	13.0.0	13.1.0
2016-12	RAN#74	R5-168199	1570	F	Updating Annex F by adding clause 7 test cases for eMTC	13.0.0	13.1.0
2016-12	RAN#74	R5-168200	1571	F	Updating Annex E by adding test cases 6.2.10 and 6.2.11, eMTC	13.0.0	13.1.0
2016-12	RAN#74	R5-168202	1572	F	Adding Reference PRACH Configuration for eMTC into 36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-168206	1576	F	Updating eMTC RRM test case 7.1.10	13.0.0	13.1.0
2016-12	RAN#74	R5-168208	1577	F	Updating eMTC RRM test case 7.1.11	13.0.0	13.1.0
2016-12	RAN#74	R5-168248	1585	F	Addition of new eMTC RRM test cases to Annex E of 36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-168251	1586	F	Introduction of eMTC RRM new test case 4.2.14	13.0.0	13.1.0
2016-12	RAN#74	R5-168289	1588	F	HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 In-Band mode under enhanced coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-168295	1590	F	Adding new eMTC RRM test cases to Annex E	13.0.0	13.1.0
2016-12	RAN#74	R5-168296	1591	F	Introduction of new eMTC RRM test case 8.1.29 for category M1	13.0.0	13.1.0
2016-12	RAN#74	R5-168297	1592	F	Introduction of new eMTC RRM test case 8.1.30 for category M1	13.0.0	13.1.0
2016-12	RAN#74	R5-168306	1594	F	Updated to DC RRM inter-frequency event triggered reporting test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168475	1600	F	Uncertainties, Test Tolerances and RSRQ absolute accuracy requirements for MTC RRM TC 9.2.42.1, 9.2.43.1 and 9.2.44.1	13.0.0	13.1.0
2016-12	RAN#74	R5-168504	1604	F	NB-IoT TA adjustment enhanced coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-168505	1605	F	HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 under normal coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-168608	1619	F	Update to CE Mode A RLM test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168620	1620	F	Updates to message contents for eMTC RRM TC 4.2.12	13.0.0	13.1.0
2016-12	RAN#74	R5-168621	1621	F	Updates to message contents for eMTC RRM TC 4.2.13	13.0.0	13.1.0
2016-12	RAN#74	R5-168622	1622	F	Test Tolerances for eMTC RRM TC 4.2.12	13.0.0	13.1.0
2016-12	RAN#74	R5-168623	1623	F	Test Tolerances for eMTC RRM TC 4.2.13	13.0.0	13.1.0
2016-12	RAN#74	R5-168662	1626	F	Introduction of Intra frequency handover Test case 5.1.13 for Cat-M1 UEs in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168663	1627	F	Introduction of Intra frequency handover Test case 5.1.14 for Cat-M1 UEs in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168664	1628	F	Introduction of Intra frequency handover Test case 5.1.15 for Cat-M1 UEs in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168678	1629	F	Clarification of test parameters for RRM asymmetric bandwidth 2CA test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168679	1630	F	Correction to TDD CA Activation and Deactivation of known SCell in Non-DRX test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168680	1631	F	Correction to figure group for timing adjustment 2CA TCs	13.0.0	13.1.0
2016-12	RAN#74	R5-168681	1632	F	Correction to RRM TDD FDD 2CA Event Triggered Report test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-168682	1633	F	Correction to Information Bit Payload for TDD PDSCH RMC	13.0.0	13.1.0
2016-12	RAN#74	R5-168710	1636	F	Adding new test case 7.3.44 DC RLM FDD-TDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168711	1637	F	Adding new test case 7.3.45 DC RLM TDD-FDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168713	1638	F	Adding new test case 7.3.46 DC RLM TDD-FDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168716	1639	F	Adding new test case 7.3.47 DC RLM TDD-FDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168718	1640	F	Adding new DC RLM TDD-FDD test cases into Annex E	13.0.0	13.1.0
2016-12	RAN#74	R5-168732	1644	F	Adding new test cases for 4 Rx RRM RLM FDD testing to annex E	13.0.0	13.1.0
2016-12	RAN#74	R5-168810	1646	F	Updating DC RLM RRM test cases	13.0.0	13.1.0

2016-12	RAN#74	R5-168814	1648	F	Updating DC RLM RRM test cases Annex F	13.0.0	13.1.0
2016-12	RAN#74	R5-168830	1650	F	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-168836	1652	F	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA in DRX	13.0.0	13.1.0
2016-12	RAN#74	R5-168848	1653	F	Updating test cases 9.1.6, 9.1.7, 9.1.12, 9.1.13 To include band group FDD_B	13.0.0	13.1.0
2016-12	RAN#74	R5-168854	1654	F	Updating test cases 9.1.6.2, 9.1.7.2, 9.1.12.2, 9.1.13.2 To include band group FDD_B	13.0.0	13.1.0
2016-12	RAN#74	R5-168880	1656	F	Updating eMTC RRM test case 6.1.9	13.0.0	13.1.0
2016-12	RAN#74	R5-168881	1657	F	Updating eMTC RRM test case 6.1.10	13.0.0	13.1.0
2016-12	RAN#74	R5-168882	1658	F	Updating eMTC RRM test case 6.1.11	13.0.0	13.1.0
2016-12	RAN#74	R5-168938	1659	F	Uncertainties and Test Tolerances for intra frequency absolute and relative RSRP accuracies for UE category 0 Aggregation	13.0.0	13.1.0
2016-12	RAN#74	R5-168971	1661	F	E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeA	13.0.0	13.1.0
2016-12	RAN#74	R5-169517	1634	F	Correction to RRM TDD FDD 2CA measurement accuracy test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-169529	1556	F	Introduction of Cell configuration mapping for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-169552	1610	F	Addition of the new TC 9.1.44 4 DL CA PCell in FDD FDD-TDD RSRP for E-UTRAN in Carrier Aggregation	13.0.0	13.1.0
2016-12	RAN#74	R5-169553	1611	F	Addition of the new TC 9.2.45 4 DL CA PCell in FDD FDD-TDD RSRQ for E-UTRAN in Carrier Aggregation	13.0.0	13.1.0
2016-12	RAN#74	R5-169575	1578	F	New Test Case: 6.2.13: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-169576	1579	F	New Test Case: 6.2.14: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-169577	1580	F	New Test Case: 6.2.15: E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage	13.0.0	13.1.0
2016-12	RAN#74	R5-169578	1581	F	Update Annex F Test Tolerance for E-UTRAN FDD-FDD and HD-FDD Radio Link Monitoring Test in DRX for UE Category M1 Configured in CEMode A	13.0.0	13.1.0
2016-12	RAN#74	R5-169579	1560	F	Introduction of test cases 7.2.6 in TS36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-169580	1561	F	Introduction of test cases 7.2.7 in TS36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-169581	1562	F	Introduction of test cases 7.2.8 in TS36.521-3	13.0.0	13.1.0
2016-12	RAN#74	R5-169582	1601	F	New test case: 8.1.33 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169583	1602	F	New test case: 8.1.34 E-UTRAN HD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169584	1603	F	New test case: 8.1.35 E-UTRAN TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169585	1624	F	Introduction of new eMTC RRM TC 4.2.15	13.0.0	13.1.0
2016-12	RAN#74	R5-169586	1635	F	eMTC RRM TC 6.2.10 prach-StartingSubframe and numRepetitionPerPreambleAttempt should match	13.0.0	13.1.0
2016-12	RAN#74	R5-169587	1647	F	Introduction of E-UTRAN HD - FDD Intra-Frequency Case for Cat-M1 UE in Enhanced Coverage Test Case	13.0.0	13.1.0
2016-12	RAN#74	R5-169588	1649	F	Introduction of E-UTRAN TDD - TDD Intra-Frequency Case for Cat-M1 UE in Enhanced Coverage Test Case	13.0.0	13.1.0
2016-12	RAN#74	R5-169594	1660	F	Update to E-UTRAN DC intra-frequency event triggered reporting DC Test cases	13.0.0	13.1.0
2016-12	RAN#74	R5-169595	1609	F	Update of test tolerance for UE Initiation and Cease of SLSS for ProSe direct communication	13.0.0	13.1.0
2016-12	RAN#74	R5-169599	1595	F	Introduction of new eMTC RRM test case 9.1.57 for category M1	13.0.0	13.1.0
2016-12	RAN#74	R5-169600	1617	F	Addition of a new test case 9.1.59 TDD RSRP Intra frequency case for Cat-M1 UE in CEModeB	13.0.0	13.1.0
2016-12	RAN#74	R5-169601	1618	F	Update Annex F for TS 36.521-3 Test case 9.1.57, 9.1.58 and 9.1.59	13.0.0	13.1.0
2016-12	RAN#74	R5-169609	1614	F	Correction of triggering event for SCE test case 8.22.7 and 8.22.8	13.0.0	13.1.0

2016-12	RAN#74	R5-169641	1641	F	Adding Antenna connection configuration guide for 4 Rx RRM testing	13.0.0	13.1.0
2016-12	RAN#74	R5-169679	1642	F	Adding new test case 7.3.1_1 for 4 Rx RRM RLM FDD testing	13.0.0	13.1.0
2016-12	RAN#74	R5-169680	1643	F	Adding new test case 7.3.2_1 for 4 Rx RRM RLM FDD testing	13.0.0	13.1.0
2016-12	RAN#74	R5-169695	1555	F	Correction of NPDSCH RMC for NB-IoT	13.0.0	13.1.0
2016-12	RAN#74	R5-169698	1625	F	Addition of in-sync RLM test cases for NB-IOT	13.0.0	13.1.0
2016-12	RAN#74	R5-169711	1587	F	Introduction of eMTC RRM new test case 6.2.12	13.0.0	13.1.0
2016-12	RAN#74	R5-169718	1615	F	Correction of triggering event for SCE test case 8.22.11 and 8.22.12	13.0.0	13.1.0
2016-12	RAN#74	R5-169726	1606	F	Uncertainties and Test Tolerances for MTC RRM TCs 8.1.19,8.1.20,8.1.21 and 8.2.22	13.0.0	13.1.0
2016-12	RAN#74	R5-169727	1607	F	Uncertainties and Test Tolerances for MTC RRM TCs 8.2.7 and 8.2.8	13.0.0	13.1.0
2016-12	RAN#74	R5-168404	1599	F	Band 70 information to E-UTRA band group in 36.521-3	13.1.0	14.0.0
2017-01	RAN#74	-	-	-	corrections concerning the implementation of R5-168678, R5-168848, R5-169517	14.0.0	14.0.1
2017-03	RAN#75	R5-170588	1680	-	Update test case for HD-FDD Inter-frequency RRC Re-establishment for UE category NB1 In-Band mode under enhanced coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-170589	1681	-	Update test case for HD-FDD Intra-frequency RRC Re-establishment for UE category NB1 under normal coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-170590	1682	-	Update test case for Timing Advance Adjustment Accuracy Test for NB-IoT UE in Enhanced Coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-170598	1683	-	Addition of the new TC 8.16.53 4 DL PCell in FDD CA Event Triggered Reporting with 3 Deactivated SCells in Non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-170629	1684	-	Resubmission of R5-170023 Introduction of RRM Annex I for NB-IoT	14.0.1	14.1.0
2017-03	RAN#75	R5-170713	1696	-	Annex update to RRM spec for LAA	14.0.1	14.1.0
2017-03	RAN#75	R5-170727	1698	-	Introduction of Test case 8.16.63 4DL CA Activation/Deactivation PCell in FDD, unknown SCell	14.0.1	14.1.0
2017-03	RAN#75	R5-170795	1706	-	Uncertainties and Test Tolerances for the Test Cases 9.1.29 and 9.1.30	14.0.1	14.1.0
2017-03	RAN#75	R5-170821	1709	-	Addition of Table H.3.1-2a for E-UTRAN intra frequency measurement configuration for Cat-M1 UE	14.0.1	14.1.0
2017-03	RAN#75	R5-170871	1710	-	(Editorial) Correction of Cell mapping information in 36.521-3 Annex E for RRM TC 9.2.25.1 and 9.2.25.2	14.0.1	14.1.0
2017-03	RAN#75	R5-170878	1712	-	Correction of SRS-Bandwidth for RRM TC 7.1.10	14.0.1	14.1.0
2017-03	RAN#75	R5-170882	1714	-	Correction of eMTC RRM TC 6.2.10 and 6.2.10 prach-StartingSubframe	14.0.1	14.1.0
2017-03	RAN#75	R5-170963	1715	-	Correction of NPDSCH RMC for NB-IoT	14.0.1	14.1.0
2017-03	RAN#75	R5-170977	1720	-	Addition of new test case 9.1.60 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with FDD Pcell	14.0.1	14.1.0
2017-03	RAN#75	R5-170978	1721	-	Addition of new test case 9.1.61 FS3 absolute and relative CSI-RSRP accuracies for E-UTRAN Carrier Aggregation in CSI-RS based discovery signal with TDD Pcell	14.0.1	14.1.0
2017-03	RAN#75	R5-170990	1725	-	Addition of Event triggered reporting on LAA deactivated SCell and E-UTRAN FDD PCell interruption in non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-170998	1726	-	Correct test procedures to DC RRM TC 8.23.x	14.0.1	14.1.0
2017-03	RAN#75	R5-170999	1727	-	Update Annex A.2 for DC PCFICH/PDCCH/PHICH parameters	14.0.1	14.1.0
2017-03	RAN#75	R5-171000	1728	-	Introduction of new eMTC RRM TC 8.1.31 for category M1	14.0.1	14.1.0
2017-03	RAN#75	R5-171001	1729	-	Introduction of new eMTC RRM TC 8.1.32 for category M1	14.0.1	14.1.0
2017-03	RAN#75	R5-171002	1730	-	Add new eMTC RRM test cases into Annex E	14.0.1	14.1.0
2017-03	RAN#75	R5-171005	1732	-	Correction to NB-IoT and LTE Cell naming used in the tests	14.0.1	14.1.0
2017-03	RAN#75	R5-171008	1733	-	Introduction of 4DL CA RRM TC 8.16.51	14.0.1	14.1.0
2017-03	RAN#75	R5-171032	1739	-	Adding eMTC RRM test cases 6.1.12-14 and 7.1.14-16 to Annex E	14.0.1	14.1.0
2017-03	RAN#75	R5-171051	1743	-	Test Tolerance updating of test cases 9.1.8.1, 9.1.9.1 To include band group FDD_B	14.0.1	14.1.0
2017-03	RAN#75	R5-171052	1744	-	Addition of the new TC 9.1.45 4DL PCell in TDD RSRP for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171053	1745	-	Addition of the new TC 9.1.48 5DL PCell in FDD RSRP for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171054	1746	-	Addition of the new TC 9.1.49 5DL PCell in TDD RSRP for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171056	1747	-	Addition of the new TC 9.2.46 4DL PCell in TDD RSRQ for E-UTRAN in CA	14.0.1	14.1.0

2017-03	RAN#75	R5-171057	1748	-	Addition of the new TC 9.2.47 5DL PCell in FDD RSRQ for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171059	1750	-	Addition of the new TC 9.2.48 5DL PCell in TDD RSRQ for E-UTRAN in CA	14.0.1	14.1.0
2017-03	RAN#75	R5-171061	1751	-	Minor correction about RSRP/RSRQ for FDD-TDD CA test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171074	1757	-	Update clause 3A.4 Antenna principles	14.0.1	14.1.0
2017-03	RAN#75	R5-171149	1766	-	Test Tolerance: Adding eMTC RRM test case 7.1.12	14.0.1	14.1.0
2017-03	RAN#75	R5-171195	1773	-	Removal of editor's note for TDD FDD 2CA RRM Test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171281	1781	-	Update of Cell configuration mapping for NB-IoT	14.0.1	14.1.0
2017-03	RAN#75	R5-171703	1734	1	Updated Annex I.4 RRM requirement exception RRM TC 8.22	14.0.1	14.1.0
2017-03	RAN#75	R5-171704	1775	1	Correction to neighbour cell config for autonomous gaps test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171727	1686	1	Update of HD-FDD UE Transmit Timing Accuracy Tests under enhanced coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171728	1688	1	Update of HD-FDD Transmit Timing Accuracy Tests for Category NB1 UE In-Band mode under normal coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171729	1689	1	Intra-frequency cell reselection under normal coverage for NB-IOT	14.0.1	14.1.0
2017-03	RAN#75	R5-171730	1741	1	Adding Test case 7.3.60 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in normal coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171731	1742	1	Adding Test case 7.3.61 HD-FDD Radio Link Monitoring Test for Out-of-sync in DRX for UE category NB1 In-band mode in extended coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171739	1695	1	LAA:Update to common RRM configuration.	14.0.1	14.1.0
2017-03	RAN#75	R5-171740	1716	1	Addition of LAA SCell activation and deactivation of known SCell with E-UTRA FDD PCell in non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-171741	1749	1	Adding LAA RRM test case 8.26.9	14.0.1	14.1.0
2017-03	RAN#75	R5-171742	1752	1	Adding LAA RRM test case 8.26.10	14.0.1	14.1.0
2017-03	RAN#75	R5-171743	1753	1	Adding LAA RRM test case 9.2.51	14.0.1	14.1.0
2017-03	RAN#75	R5-171744	1754	1	Adding LAA RRM test case 9.2.52	14.0.1	14.1.0
2017-03	RAN#75	R5-171746	1759	1	Test tolerance addition for TS 36.521-3 Test case 8.22.5 and 8.22.6	14.0.1	14.1.0
2017-03	RAN#75	R5-171755	1765	1	LAA: Addition of the new test case and test tolerances for FDD intra frequency absolute and relative RSRP accuracies for SCell with frame structure 3	14.0.1	14.1.0
2017-03	RAN#75	R5-171759	1691	1	Uncertainties and Test Tolerances for TS 36.521-3 Test Cases 4.2.15, 4.2.16, and 4.2.17 and Corresponding Core Specification Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171768	1767	1	Test Tolerance CR, adding eMTC RRM test case 7.1.14	14.0.1	14.1.0
2017-03	RAN#75	R5-171769	1768	1	Test Tolerance CR, adding eMTC RRM test case 7.1.15	14.0.1	14.1.0
2017-03	RAN#75	R5-171770	1769	1	Test Tolerance CR, adding eMTC RRM test case 7.1.16	14.0.1	14.1.0
2017-03	RAN#75	R5-171771	1672	1	Test Tolerances Updates in Test Case: 6.2.14: E-UTRAN HD-FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage and Other Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171772	1673	1	Test Tolerances Updates in Test Case: 6.2.15: E-UTRAN TDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage and Other Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171773	1670	1	Test Tolerances and Uncertainties Updates in Annexes E and F for Test Cases 6.2.13-15, 7.3.50-51 and 7.3.54-55	14.0.1	14.1.0
2017-03	RAN#75	R5-171783	1774	1	Correction to test parameters and test tolerance for RRM 2CA asymmetric bandwidth test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171799	1674	1	New Test Case: E-UTRAN FDD-FDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171800	1675	1	New Test Case: E-UTRAN HD-FDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171801	1676	1	New Test Case: E-UTRAN TDD Intra Frequency Handover for Cat-M1 UEs in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171804	1690	1	Update to CE mode A RLM test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171805	1711	1	New SIB1-BR-r13 and PRACH Config SIB default introduced for RRM TC 6.2.10	14.0.1	14.1.0
2017-03	RAN#75	R5-171806	1731	1	Update Intra-frequency test cases for Cat-M1 UE in normal and enhanced coverage	14.0.1	14.1.0
2017-03	RAN#75	R5-171808	1771	1	Correction to OCNG pattern for Cat-M1 FD-FDD and HD-FDD re-establishment TCs	14.0.1	14.1.0
2017-03	RAN#75	R5-171810	1779	1	eMTC RRM TC 6.2.10 clarification on test procedure	14.0.1	14.1.0
2017-03	RAN#75	R5-171811	1780	1	Adding eMTC RRM test case 8.1.36	14.0.1	14.1.0
2017-03	RAN#75	R5-171812	1782	1	Adding eMTC RRM test case 8.1.37	14.0.1	14.1.0
2017-03	RAN#75	R5-171854	1701	1	Introduction to RRM test case 8.16.57 4DL FDD CA activation and deactivation of known SCell in non-DRX	14.0.1	14.1.0

2017-03	RAN#75	R5-171855	1702	1	Introduction to RRM test case 8.16.61 4DL FDD CA activation and deactivation of unknown SCell in non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-171856	1705	1	Introduction to RRM test case 9.1.50 5DL FDD RSRP for E-UTRAN in Carrier Aggregation	14.0.1	14.1.0
2017-03	RAN#75	R5-171857	1777	1	New RRM TC 8.16.55: E-UTRAN FDD 4 DL CA Event Triggered Reporting on Deactivated SCell with PCell and SCell Interruptions in Non-DRX	14.0.1	14.1.0
2017-03	RAN#75	R5-171858	1707	1	Introduction of Rel-13 CA RRM new test case 9.1.46	14.0.1	14.1.0
2017-03	RAN#75	R5-171859	1708	1	Introduction of Rel-13 CA RRM new test case 9.1.47	14.0.1	14.1.0
2017-03	RAN#75	R5-171873	1758	1	Adding new test case 8.3.7 for IncMon RRM testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171874	1761	1	Adding new test case 8.4.7 for IncMon RRM testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171886	1735	1	Update RRM general section 3 for V2X information	14.0.1	14.1.0
2017-03	RAN#75	R5-171891	1755	1	Adding new test case 7.3.3_1 for 4 Rx RRM RLM TDD testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171892	1756	1	Adding new test case 7.3.4_1 for 4 Rx RRM RLM TDD testing	14.0.1	14.1.0
2017-03	RAN#75	R5-171899	1699	1	Introduction of Test case 8.16.59 4DL CA Activation/Deactivation PCell in FDD, known SCell	14.0.1	14.1.0
2017-03	RAN#75	R5-171901	1679	1	Update TS 36.521-3 with Addition of LTE Band 48	14.0.1	14.1.0
2017-03	RAN#75	R5-171926	1738	1	Updates to HD-FDD RLM In-sync tests for category NB1	14.0.1	14.1.0
2017-03	RAN#75	R5-171927	1717	1	Test tolerance CR, Addition of new test case 8.26.5 E-UTRAN FDD-TDD intra-frequency event triggered reporting in non-DRX under FS3	14.0.1	14.1.0
2017-03	RAN#75	R5-171928	1718	1	Test tolerance CR, Addition of new test case 8.26.6 E-UTRAN TDD-TDD intra-frequency event triggered reporting in non-DRX under FS3	14.0.1	14.1.0
2017-03	RAN#75	R5-171929	1719	1	Test tolerance CR, Update Annex F for test tolerance of test cases 8.26.5 and 8.26.6	14.0.1	14.1.0
2017-03	RAN#75	R5-171933	1671	1	Test Tolerances Updates in Test Case: 6.2.13: E-UTRAN FDD Contention Based Random Access Test for Cat-M1 UEs in Enhanced Coverage and Other Updates	14.0.1	14.1.0
2017-03	RAN#75	R5-171960	1737	1	Uncertainties and Test Tolerance for DC RRM intra-frequency event triggered reporting test cases	14.0.1	14.1.0
2017-03	RAN#75	R5-171964	1722	1	Test tolerance CR, Addition of new test case 7.3.62 Radio Link Monitoring Test for In-sync with DRX under EC for Category NB1	14.0.1	14.1.0
2017-03	RAN#75	R5-171965	1723	1	Test tolerance CR, Addition of new test case 7.3.63 Radio Link Monitoring Test for In-sync with DRX under NC for Category NB1	14.0.1	14.1.0
2017-03	RAN#75	R5-171971	1700	2	Correction to intra frequency handover test cases for Cat-M1 UEs in CEModeA	14.0.1	14.1.0
2017-03	RAN#75	R5-171972	1703	2	Uncertainties and Test Tolerances for the test cases 8.1.33, 8.1.34 and 8.1.35 for Cat-M1 UE in CEModeB	14.0.1	14.1.0
2017-03	RAN#75	R5-171973	1704	2	Uncertainties and Test Tolerances for the Test Cases 8.1.23, 8.1.24, and 8.1.25 for Cat-M1 UE in CEModeA	14.0.1	14.1.0
2017-03	RAN#75	R5-171974	1736	2	Uncertainties and Test Tolerance for Cat M1 TC8.1.29 and 8.1.30	14.0.1	14.1.0
2017-03	RAN#75	R5-171975	1740	1	Updating eMTC RRM test cases 6.1.9 – 11	14.0.1	14.1.0
2017-03	RAN#75	R5-171976	1762	2	Test Tolerance CR, adding eMTC RRM test case 6.1.12	14.0.1	14.1.0
2017-03	RAN#75	R5-171977	1763	2	Test Tolerance CR, adding eMTC RRM test case 6.1.13	14.0.1	14.1.0
2017-03	RAN#75	R5-171978	1764	2	Test Tolerance CR, adding eMTC RRM test case 6.1.14	14.0.1	14.1.0
2017-03	RAN#75	R5-171979	1772	2	Correction to MPDCCH and PDSCH Reference Channels for Cat-M1	14.0.1	14.1.0
2017-03	RAN#75	R5-171985	1787	1	Correction invalid RI-ConfigIndex in TC 8.16.38	14.0.1	14.1.0
2017-03	RAN#75	R5-171986	1693	2	Uncertainties and Test Tolerances for RRM TC 9.1.18.2_1, 9.1.19.2_1 and 9.1.24.2_1	14.0.1	14.1.0
2017-03	RAN#75	R5-171987	1694	2	Uncertainties and Test Tolerances for RRM TC 9.9.1.1_1 and 9.9.2.1_1	14.0.1	14.1.0

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